

TECHNOLOGY DEPT

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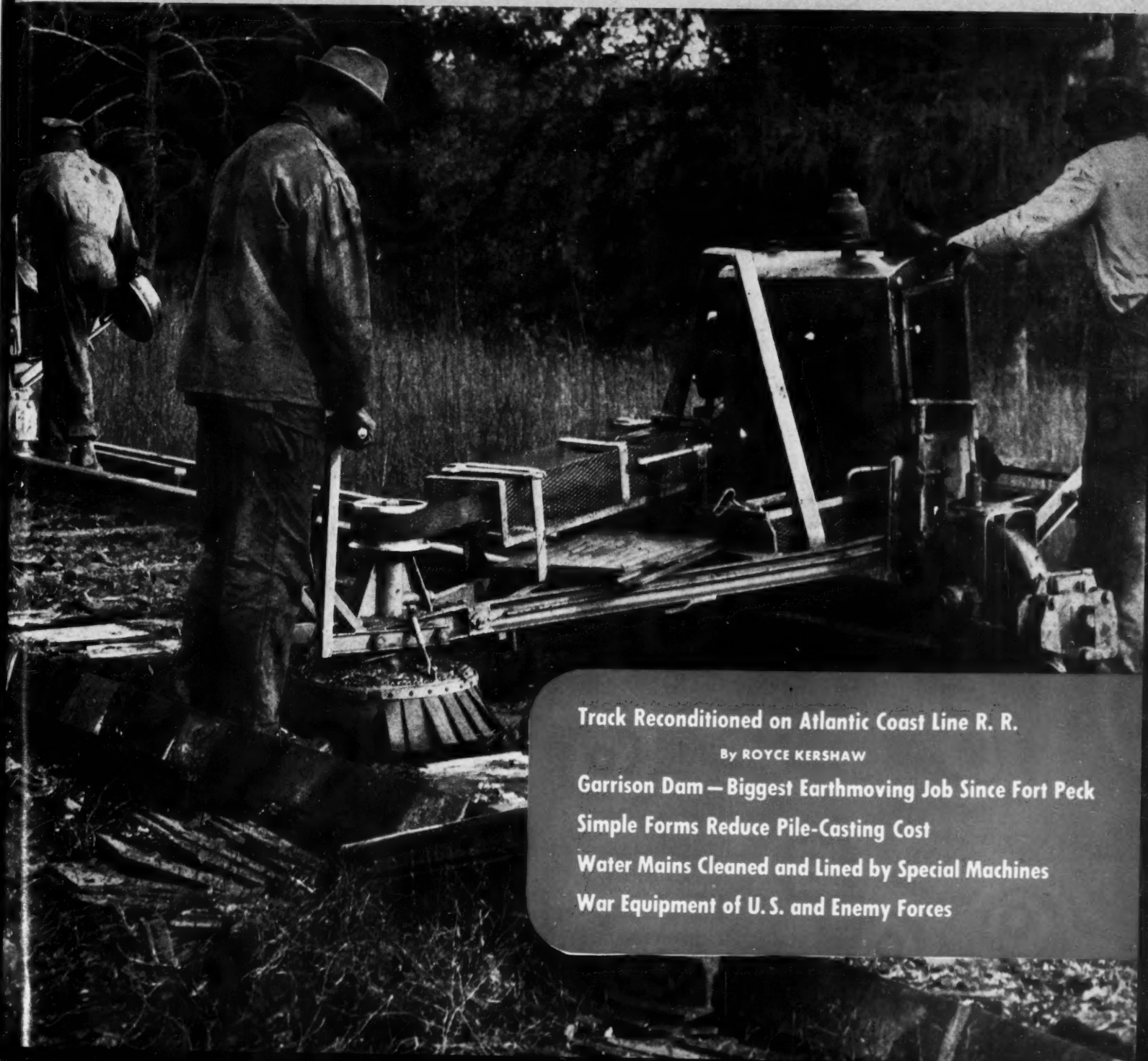
AUG 5 - 1946

DEPT. OF THE ARMY

# Construction Methods

JUNE 1946

ADZING MACHINE prepares ties for new rails on railroad reconditioning project.



Track Reconditioned on Atlantic Coast Line R. R.

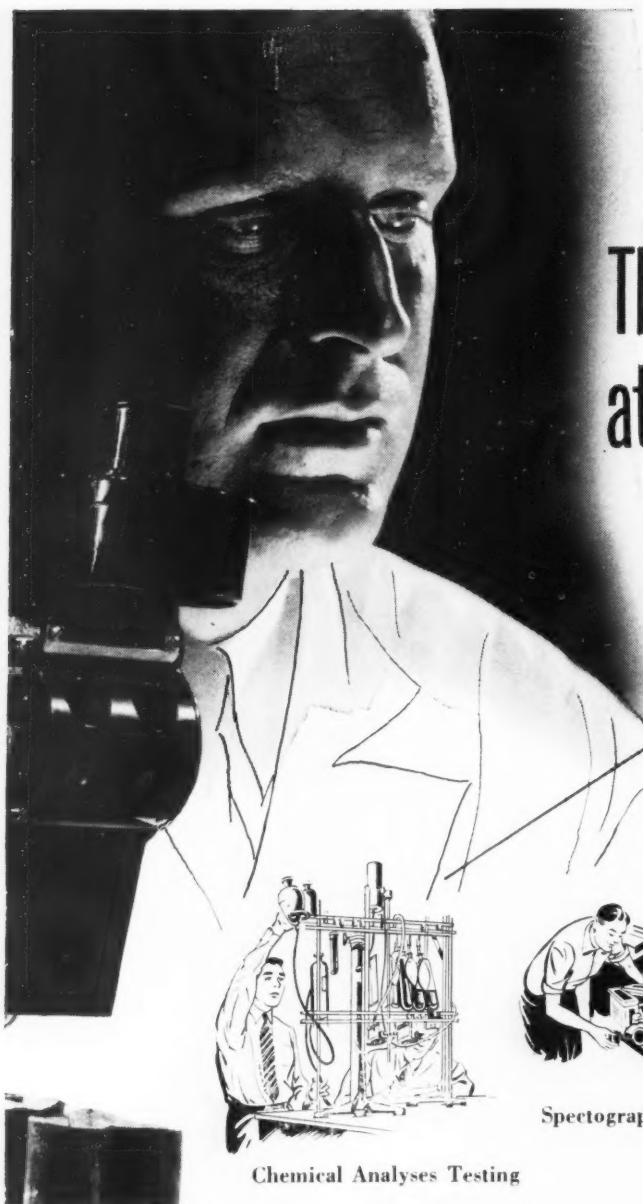
By ROYCE KERSHAW

Garrison Dam — Biggest Earthmoving Job Since Fort Peck

Simple Forms Reduce Pile-Casting Cost

Water Mains Cleaned and Lined by Special Machines

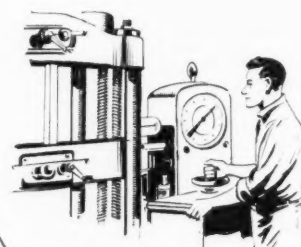
War Equipment of U. S. and Enemy Forces



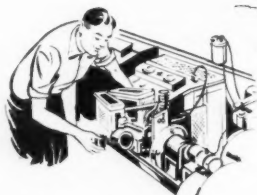
## The Trained Eyes at Inland—



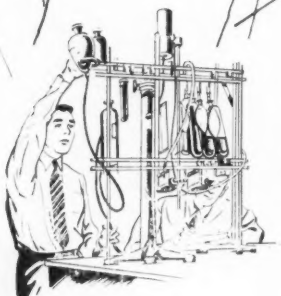
Optical Pyrometer Temperature Testing



Tensile Strength Testing



Spectrographic Test for Elements



Chemical Analyses Testing

Every day, year in and year out, ton after ton of steel passes the scrutiny of Inland's "trained eyes" . . . Samples are gathered from all operations and subjected to exacting tests before the steel is permitted to be rolled into final form.

Chemical analysis maintains a careful control over all elements . . . holds them in proper proportion and within rigid tolerances. Further control is possible by means of the spectrophotometer and the comparator, that present a graphic record of the exact composition. Optical Pyrometers eliminate guesswork . . . allow operators to control temperatures

accurately at all times. In addition, tensile, hardness and metallographic tests are conducted to maintain satisfactory properties. The combined control exerted by these tests is assurance of the quality fabricators can expect . . . and get from Inland Steels.

Inland steelmakers working together closely, carefully on each individual order means *that* order will "measure up" to every requirement when delivered.

Inland Steel Company, 38 S. Dearborn St., Chicago 3, Illinois. Sales Offices: Cincinnati, Detroit, Indianapolis, Kansas City, Milwaukee, New York, St. Louis, St. Paul.

**PRINCIPAL PRODUCTS:** BARS  
STRUCTURALS • PLATES • SHEETS  
STRIP • TIN PLATE • FLOOR PLATE  
PILING • REINFORCING BARS • RAILS  
TRACK ACCESSORIES

# INLAND STEEL



# Construction Methods

A PUBLISHED MONTHLY OF CONSTRUCTION EQUIPMENT, MATERIALS AND METHODS

WILEY PUBLICATIONS, INC.

350 WEST 42ND STREET, NEW YORK 36, N. Y.

Subscription prices: Single copy, 20c; 1 year, \$2.00; 2 years, \$3.50; 3 years, \$5.00. Outside U. S. A., add postage.

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Postmaster: Please send address changes to Construction Methods, 350 West 42nd Street, New York 36, N. Y.

## Cuts and Fills

SOME DAY A SMART equipment manufacturer is going to produce a high-steaming oil-burning boiler designed for easy mounting, say in place of the counterweight, on a crawler crane for furnishing steam for piledriving.

SIX MONTHS AGO the construction equipment industry was hoping the surplus machinery overseas at the end of the war would never come back. Three months ago the industry wished the equipment could be returned. Today the precious stuff is rolling in, but wishes have turned to gripes because most of it is gobbled up by veterans and other high-priority claimants or is bogged down in the surplus disposal cumbersome process. The Navy is handling 99 shiploads in the first schedule, the Army has loaded 110 shiploads.

MATERIALS SHORTAGES, lack of equipment and labor uncertainties are curtailing construction far more than is the building ban. For example, not a single bid was tendered for five million dollars' worth of superhighway jobs advertised in New York state last month.

SEABEE EX-OFFICERS, who headed up one of the outstanding military outfits of the War, are urged to join a new voluntary organization of Navy Civil Engineer Corps Reserve officers. Rear Admiral Manning, new head of the Bureau of Yards and Docks and the Corps, says that: "Surely this group which accomplished so much should remain united in such an organization as is now contemplated to the end that the fine comradeship during the war years may be continued and that we may again be ready should our country call." Sounds like a good idea, especially if it is developed along proposed lines of a decentralized organization of professional nature with monthly seminars and an annual two-week training course. Get in touch with Capt. C. Ken Weidner, U.S.N.R., Civil Engineer Corps, 2804 Arlington Annex, Arlington, Va., if you're interested.

SOME DAY we'll see contractors busy building throughways into our major cities to relieve intolerable traffic conditions. These arteries, as President Truman recently pointed out, will do much to reduce the traffic accident toll that is now receiving so much attention.

JUNE, 1946

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### JAMES H. MCGRAW, Founder and Honorary Chairman

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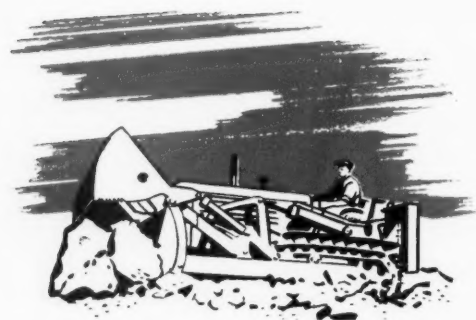
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## **We're not tolerant of tolerances!**

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In fact, we're very exacting! For example, all splines of transmission shafts on Oliver "Cletrac" crawler tractors are ground to a tolerance of .001—insuring true running and easy shifting of gears.

These close tolerances—the precision fits so necessary for smooth, quiet operation—are a primary essential of every operation in the Oliver "Cletrac" plant. And those tolerances are carefully checked by the most modern testing devices

to guarantee the maintenance of the outstanding quality that characterizes every Oliver "Cletrac" tractor.

Materials, design and workmanship are all based on one standard—the built-in quality that assures years of dependable, economical service.

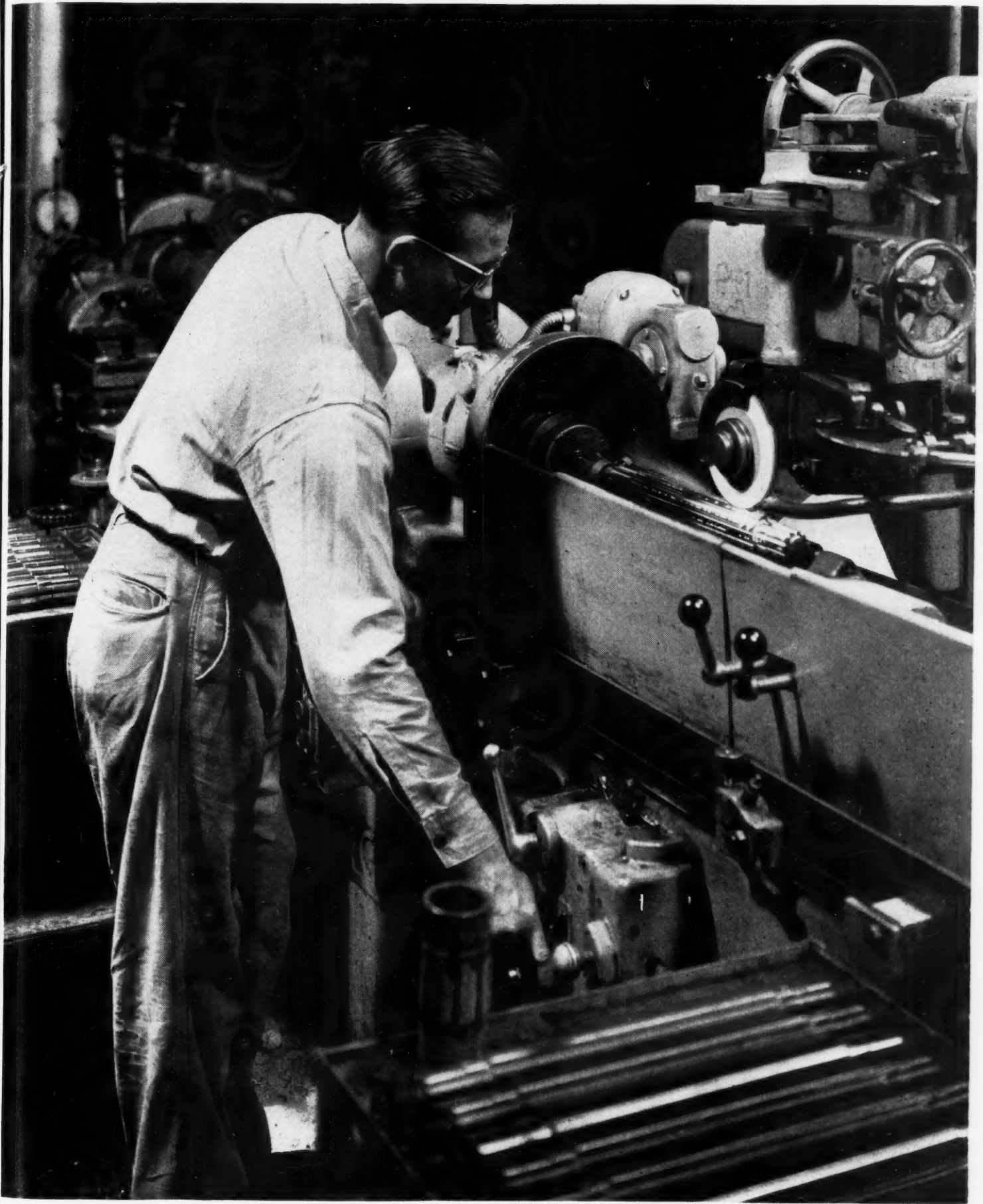
Maintenance of that standard enables your Oliver "Cletrac" dealer to offer you the finest in crawler tractors—for your every need.

# **CLETRAC**



*a product of*  
**The OLIVER Corporation**

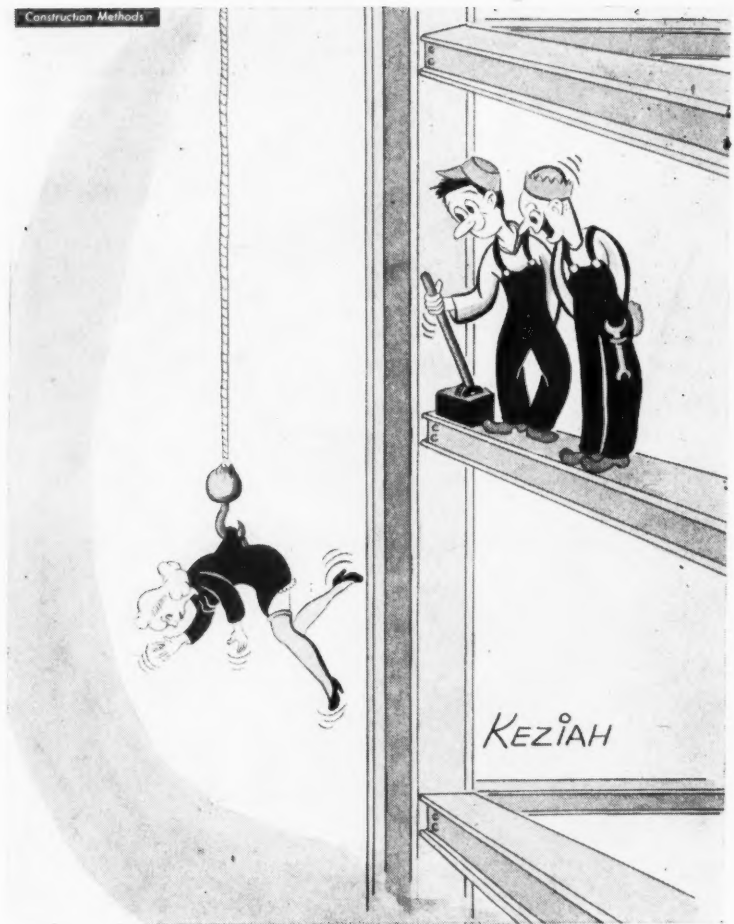




*Grinding splines of transmission shaft to .001 tolerances in the Oliver "Cletrac" Plant.*

# THE JOB JESTER

CARTOONS DRAWN FOR CONSTRUCTION METHODS



"Pretty good fishing, Frank."



"I thought that as president of the Ajax Construction Corp., it would be an appropriate gesture to have your wedding cake made of concrete."



"Perhaps you'd better ask them how long it's going to take before we wait any longer."



# 'INCOR' *Sure Can Take it!*



**TEN YEARS ON QUEENSBOROUGH BRIDGE—  
OVER A QUARTER BILLION CARS AND TRUCKS —  
'INCOR' CONCRETE AS SOUND AS A BELL!**

**F**EW places are as busy as New York City's Queensborough Bridge . . . 2500 vehicles per hour, one-third trucks and buses, day and night average. Paving has to have stamina to stand up under a beating like that. Just ten years ago, the bridge approaches were concreted with 'Incor' 24-Hour Cement. Placed in sections, traffic was maintained during construction . . . concrete placed one day was ready for service the next . . . 'Incor' saved months of congestion . . . rapid reuse cut form costs to a minimum. Ten years . . . over a quarter of a billion cars, trucks and buses . . . 'Incor' concrete still as sound as a bell, ready for a lot more punishment. Typical 'Incor' performance!

Use 'Incor'\*, America's FIRST high early strength portland cement . . . save days and dollars at the outset . . . get extra years of durable, wear-resistant, economical service.

\*Reg. U. S. Pat. Off.



## LONE STAR CEMENT CORPORATION

Offices: ALBANY • BIRMINGHAM • BOSTON • CHICAGO • DALLAS • HOUSTON • INDIANAPOLIS • JACKSON, MISS.  
KANSAS CITY, MO. • NEW ORLEANS • NEW YORK • NORFOLK • PHILADELPHIA • ST. LOUIS • WASHINGTON, D. C.

LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 15 MODERN MILLS, 25,300,000 BARRELS ANNUAL CAPACITY

# LOW OPERATING COST

Modern engineering principles built into every LIMA shovel, crane and dragline make low operating costs possible.

# INDEPENDENT OPERATIONS (WITH ★ AIRCONTROL)

Hoist, swing, travel and boom up or down simultaneously — an extra value feature.

*It's all in the Name*

# MOBILITY

The crawlers are long and wide to afford sure footing on soft or uneven ground. They steer from the cab with cab in any position.

# ANTI-FRICTION BEARINGS

All drums and important shafts rotate on anti-friction bearings — the modern means of reducing costly friction.

★ DOES NOT APPLY TO THE 3/4 yd. PAYMASTER



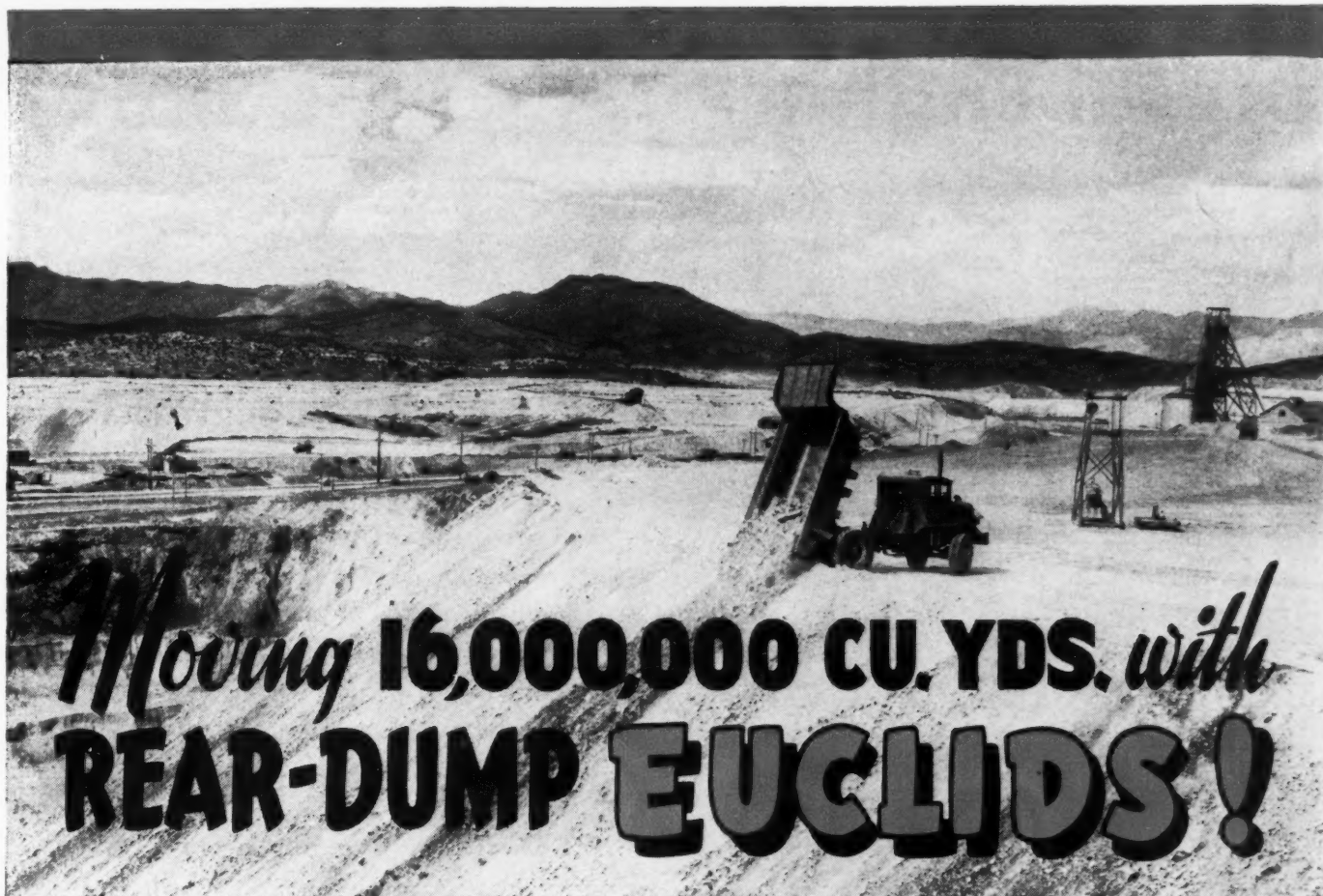
LIMA LOCOMOTIVE WORKS, INCORPORATED

Shovel and Crane Division

LIMA, OHIO, U. S. A.







The Isbell Construction Co. of Reno, Nevada is moving about 30,000 tons of overburden every working day of fifteen hours at this big open pit operation for one of the large copper producers in eastern Nevada.

Loaded by  $2\frac{1}{2}$  cu. yd. shovels, 23 Rear-Dump Euclids carry full 15-ton loads on hauls up to one mile in length. Working at an altitude of approximately 7,000 ft. the Euclids have plenty of power and speed for the long hauls and maximum adverse grades of 8%.

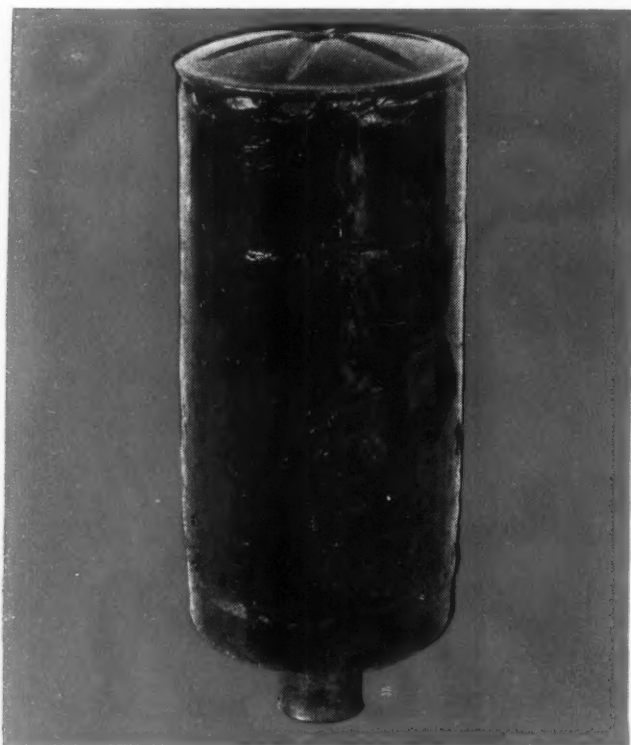
A leading contractor in the West, Isbell Construction purchased 10 Rear-Dumps of 15-ton capacity in 1943 and now has a total of 23 Euclids. Coming from men who know equipment and use it on the toughest jobs, these repeat orders are evidence of the efficient and reliable performance that is built into every Euclid.

Write for facts and figures on what Euclids can do for you on present or future work.

**The EUCLID ROAD MACHINERY Co.**  
CLEVELAND 17, OHIO



# Diesel Engine **DANGER** points



*Filter deposits formed in 204 hours with best un-compounded mineral oil.*

## RPM DELO Oil Reduces Filter Clogging Two Ways

As the two filters illustrated show, RPM DELO Diesel Engine Lubricating Oil greatly lengthens the time between shutdowns for filter servicing. This is accomplished in two ways:

1. A detergent in RPM DELO Oil prevents the stuck piston rings which, through blow-by, permit dust, unburned fuel and carbon to mix with oil.
2. Another compound in RPM DELO Oil fortifies it against oxidation.

Other additives in RPM DELO Oil protect Diesel Engines against corrosion, excessive wear on upper cylinder walls, and foaming.

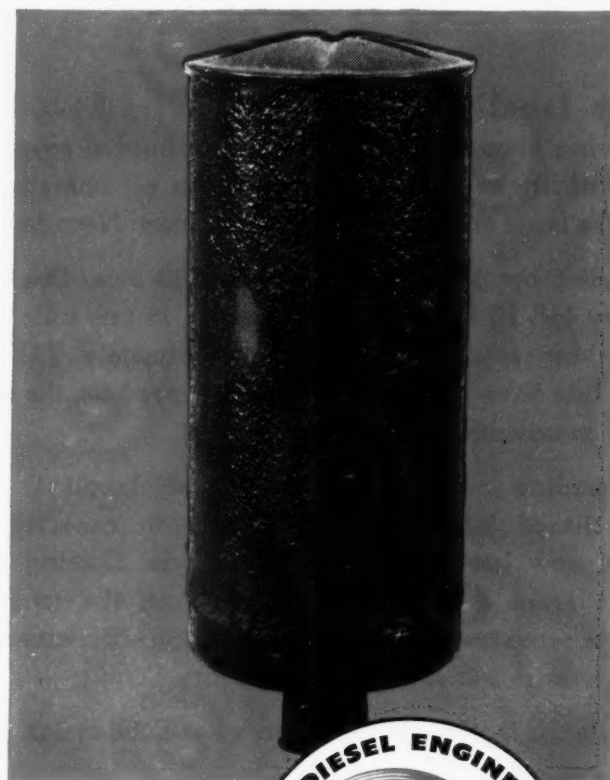
To match the fine performance of RPM DELO OIL, use these equally efficient companion products from the same famous "RPM" line—RPM HEAVY DUTY MOTOR OIL—RPM COMPOUNDED MOTOR OIL—RPM GEAR OILS AND LUBRICANTS—RPM GREASES. For additional information or name of your distributor, write any of the companies below:

STANDARD OF CALIFORNIA • 225 Bush St., San Francisco 20, California  
THE CALIFORNIA COMPANY • 17th and Stout Streets, Denver 1, Colorado  
STANDARD OIL COMPANY OF TEXAS • El Paso, Texas  
THE CALIFORNIA OIL COMPANY • 30 Rockefeller Plaza, New York 20

## Clogged Oil Filters Cause Frequent Shutdowns

One cause of frequent costly and time-wasting Diesel shutdowns is filter clogging. The condition can become dangerous since a clogged filter may stop circulation of oil to the engine if the warning of a drop in oil pressure is not heeded. Analysis of filter deposits prove them to be composed of products resulting from incomplete burning of the fuel and oxidation of oil plus iron, silica and water.

*Filter Deposit formed in 1230 hours with RPM DELO Oil.*





*A development of*  
**B.F. Goodrich**  
**FIRST IN RUBBER**



## It's what you can't see that makes this off-the-road tire last longer

**H**ERE'S a story that may help you get more for your tire money. Rock and dirt hauling, like strip mining, is a tough life for tires—especially in wet weather. Traction gets bad. Slippage is a problem. Heavy loads strain the tire body. And when tires, under load, take shocking impacts from rocks and ruts—bruises, ply separation, and blow-outs often result.

To protect users against such losses, B. F. Goodrich engineers developed a special tire with unique features . . . the B. F. Goodrich Universal (shown above). The Universal has a tread with thick, heavy lugs that protect the undertread. But the tread is so designed that the natural running action pushes mud and dirt toward the edges. The tire stays clean. It gives excellent

traction in *either* direction—resists side slippage.

B. F. Goodrich engineers went further. They developed an entirely new construction principle—the *shock shield*. It's a set of four breakers—layers of rubber-coated rayon cords—built in between the tread and the plies. These breakers are in pairs, with the cords in each pair running parallel to each other—but with each pair running in opposite directions to give balanced strength. The breakers are cushioned with thick layers of special shock-resistant rubber.

Under impact, the cords in the breakers stretch together, *not* across each other, and return to their original position. The blow is *distributed* and *absorbed* by the rubber cushions; the

shock passed on to the cord body is greatly reduced.

Users of the Universal report fewer bruises, lower repair bills, longer wear, and say that more tires can be retreaded. One operator reports that B. F. Goodrich Universals averaged 4571 hours, compared to approximately 1600 hours from another make.

Supplies of most sizes of off-the-road tires are now quickly available. See the B. F. Goodrich dealer, or write us direct. *The B. F. Goodrich Company, Akron, Ohio.*

*Truck Tires* **BY**  
**B. F. Goodrich**

# BUYING ROAD STEEL?

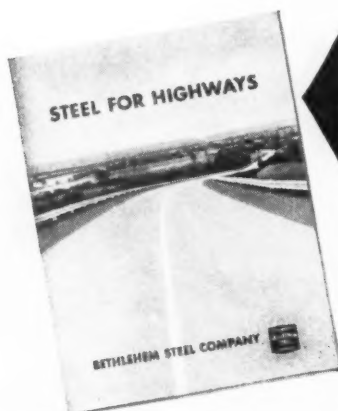
*Get this "package" service  
from Bethlehem*



It won't be tied up with ribbon—but you'll get all your road steel in one handy "package," if you place your order with Bethlehem. For we can supply every one of the steel products needed to build a concrete highway, or any kind of bridge.

Think what this means! By simply getting in touch with Bethlehem, you save time and money—save on bookkeeping, paper work, and shopping around for your needs. Your order is handled as a unit, with shipments scheduled to arrive on the job when and as you need them. No idle men or idle equipment, this way!

Add to these advantages the fact that the Bethlehem road steel line is rugged and sturdy—built for lasting performance—and you've really got something when you buy Bethlehem!



**NEW BETHLEHEM  
HIGHWAY CATALOG**

**SEND FOR YOUR COPY TODAY**

Bethlehem's new illustrated catalog, "Steel for Highways," gives complete information about Bethlehem road-steel products. Send for a copy today. Ask for Catalog 191, and address the nearest Bethlehem district office, or Bethlehem Steel Company, Bethlehem, Pa.

## BETHLEHEM PRODUCTS FOR YOUR HIGHWAY STEEL PACKAGE

ROAD JOINTS	DOWELS
DOWEL BAR SUPPORTS	CENTER STRIP
WIRE ROPE AND STRAND	
BAR MATS	BAR TIES
BEAM AND CABLE-TYPE GUARD RAILS	
HIGHWAY GUARD POSTS AND BRACKETS	
ANCHOR RODS	
RIGHT-OF-WAY FENCE AND POSTS	
PIPE	HOLLOW DRILL STEEL
DIGGING BARS	STRUCTURAL STEEL
BRIDGE FLOOR REINFORCING	
CORRUGATED SHEETS	
CONCRETE SLAB SPACERS	TURNBUCKLES
TIE RODS, SPIKES, BOLTS AND NUTS	
TIMBER BRIDGE HARDWARE	
SHEET AND H-BEARING PILING	





**When the  
Batcher Plant  
is humming  
then you want...**

A hundred thousand dollars worth of equipment waiting on that Batcher Plant—when the plant stops the job goes dead!

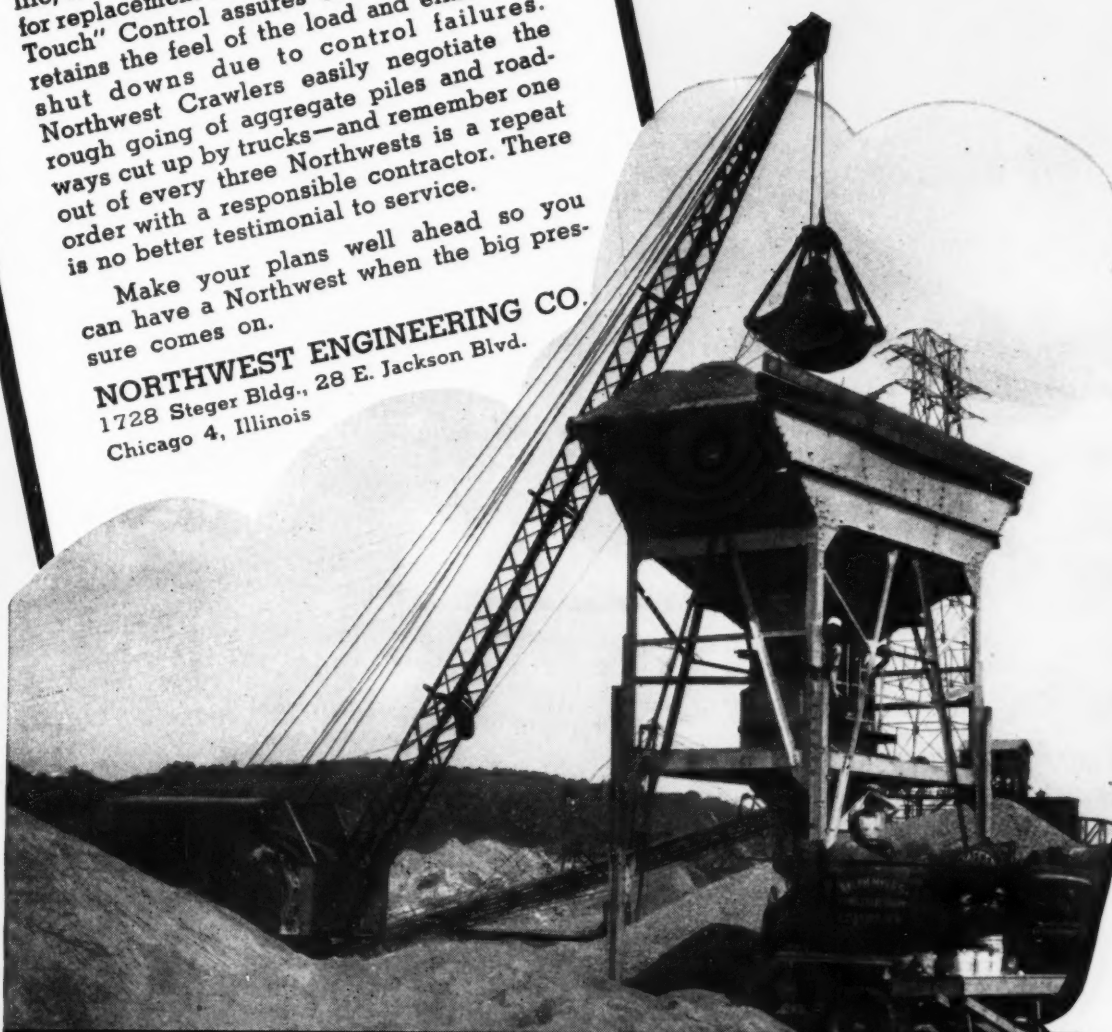
You can't afford anything but the best in cranes to keep it loaded. You're going to need a Northwest! See a Northwest at work. Talk to Northwest owners! Make a note of their satisfaction.

Northwests are fast, smooth in operation. Uniform Pressure Swing Clutches eliminate the jerks and jars present with ordinary swing clutches and assure longer life, smoother operation and less time down for replacement or adjustment. The "Feather-Touch" Control assures ease of handling, retains the feel of the load and eliminates shut downs due to control failures. Northwest Crawlers easily negotiate the rough going of aggregate piles and roadways cut up by trucks—and remember one out of every three Northwests is a repeat order with a responsible contractor. There is no better testimonial to service.

Make your plans well ahead so you can have a Northwest when the big pressure comes on.

**NORTHWEST ENGINEERING CO.**  
1728 Steger Bldg., 28 E. Jackson Blvd.  
Chicago 4, Illinois

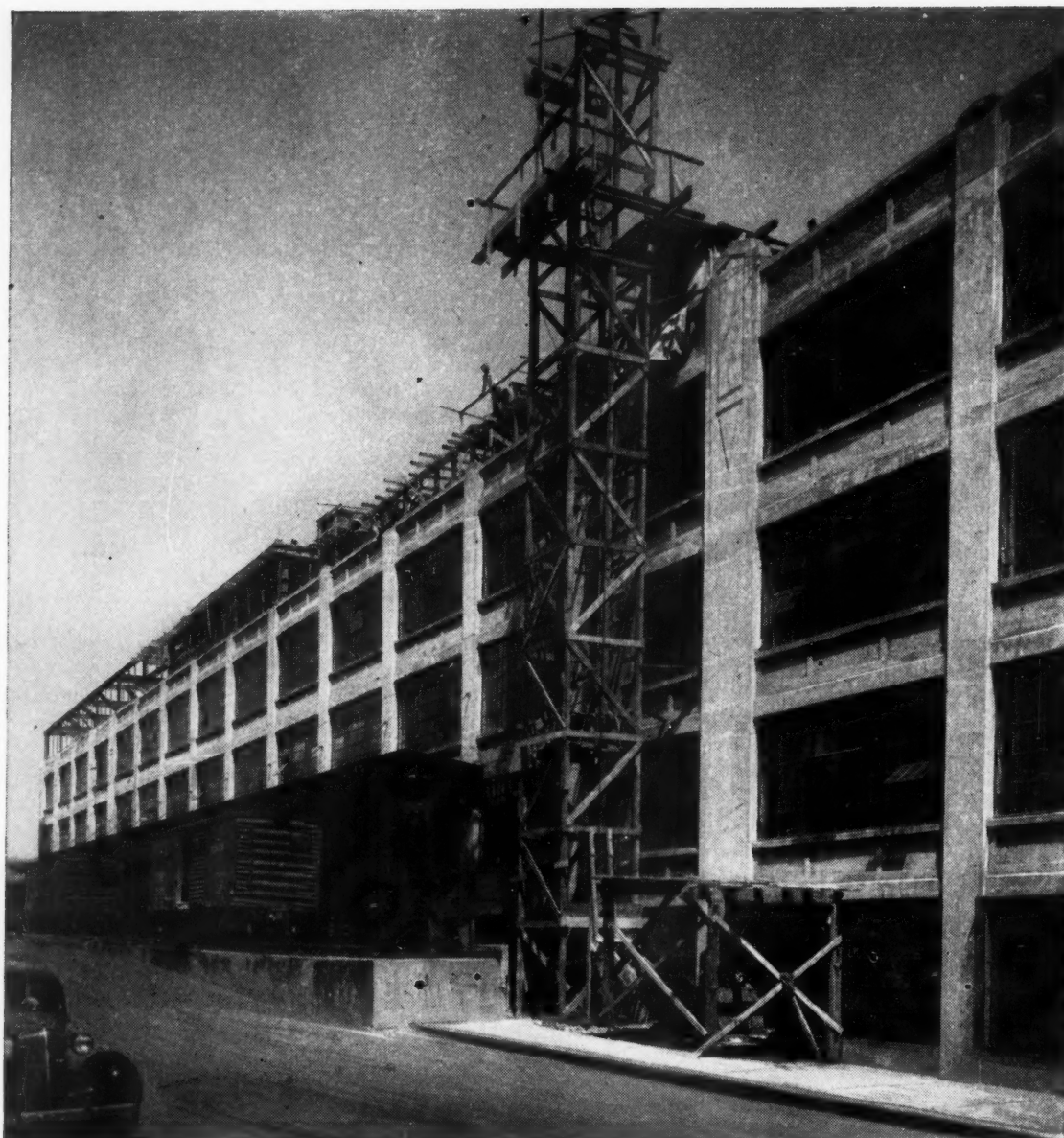
*Northwest  
Dependability*



**NORTHWEST**

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

If you have  
a **REAL**  
**ROCK SHOVEL**  
you never  
have to  
worry about  
output in  
dirt!



## HOW MUCH CONSTRUCTION WILL BE PERMITTED?

The new building control orders will permit repairs and alterations on existing industrial buildings to the tune of millions of dollars.

On top of that, over a billion dollars' worth of *new plant construction* has been estimated for 1946! And this vast industrial building program is just one part of the overall schedule facing engineers and contractors today.

In all of this construction, concrete will be used, calling for

enormous quantities of cement. And a large portion of the total will consist of the four Lehigh Cements:

**LEHIGH NORMAL CEMENT**, the time-proven cement for general construction work.

**LEHIGH EARLY STRENGTH CEMENT**, for a quicker job because it reaches service strength 3 to 5 times faster.

**LEHIGH MORTAR CEMENT**, for a mortar with strong binding qualities and minimum shrinkage . . . for all

types of masonry and for stucco.

**LEHIGH AIR-ENTRAINING CEMENT**, for minimum scaling of exposed concrete surfaces by increasing resistance to the action of freezing and thawing and ice-removal salts.

*The Lehigh Service Department will be glad to consult with you regarding the use of concrete on any of your projects.*

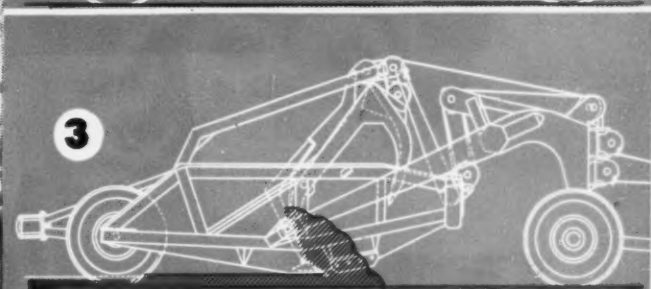
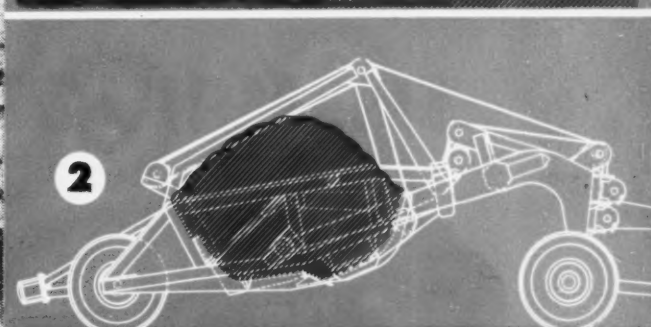
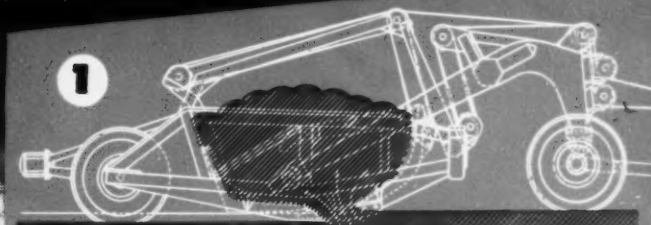


**LEHIGH PORTLAND CEMENT COMPANY** • ALLENTOWN, PA. • CHICAGO, ILL. • SPOKANE, WASH.



# Down-to-Earth Engineering

## GAR WOOD Earth Moving Equipment Features Practical Design and Sound Construction



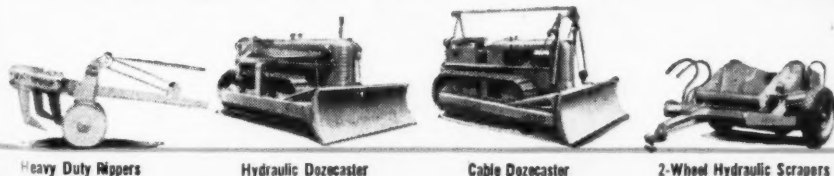
**G**AR WOOD 4-Wheel Cable Scrapers are *all scraper*, well engineered, honestly built of high quality materials, developed and proved over a period of many years—scrapers that *hold together* and get big yardage jobs done at consistently good speed with an absolute minimum of down time. Some of the many outstanding engineering features, as well as the rugged simplicity of the mechanism, are shown in the three drawings above:

1. **LOADING:** The self-loading is by positive digging to depths down to 12". "Boiling" action of dirt loads bowl and patented apron evenly by reason of proper angle of the cutting edge. Positive digging action is assured in all types of materials by proper location of draft point.
2. **CARRYING:** This position provides extremely high clearance of cutting edge, essential in traveling over uneven ground and in discharging sticky materials. Proper weight distribution with exceptionally low center of gravity assures stability—provides for maximum tire life.
3. **DUMPING AND SPREADING:** The first portion of the load dumps automatically when the apron is raised.

The remainder is forced out by *positive rolling ejection*. Note extremely large apron opening to facilitate this ejection of all types of materials. Cutting edge remains stationary throughout cycle, providing for even, *accurate control* of the spread by the heavy duty Gar Wood Cable Control Unit.

Contact your Allis-Chalmers dealer. He will be glad to show you Gar Wood earth moving equipment and arrange for you to see on-the-job performance in your locality.

**GAR WOOD  
ROAD MACHINERY**  
WITH ALLIS-CHALMERS DIESEL POWER



Heavy Duty Rippers

Hydraulic Dozercaster

Cable Dozercaster

2-Wheel Hydraulic Scrapers

OTHER GAR WOOD PRODUCTS: HOISTS AND BODIES • TANKS • CRANES AND GRAPES • HEATING EQUIPMENT • MOTOR BOATS



Sold Through  
**ALLIS-CHALMERS**  
Dealers Everywhere

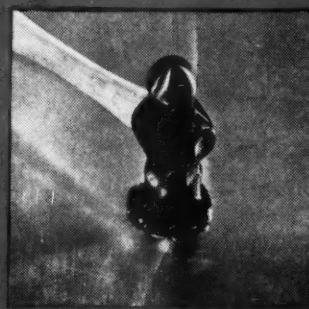
ROAD MACHINERY DIVISION  
**GAR WOOD INDUSTRIES, INC.**  
DETROIT 11, MICHIGAN



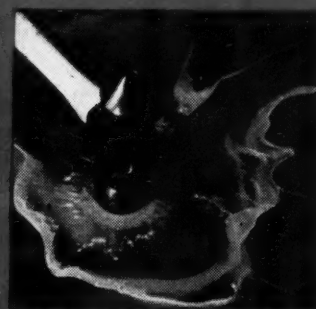
**MARFAK IS COHESIVE.** See how Mar-fak holds together — s-t-r-e-t-c-h-e-s. Seals out dirt and moisture — protects parts longer.



**GREASE SEPARATES.** Ordinary grease is not cohesive, has no stretch. It permits entrance of dirt and moisture — fails to protect parts.



**MARFAK STAYS PUT.** Hit it as hard as you can, Marfak cushions the blow, doesn't splatter — stays in the chassis bearings.



**GREASE SPLATTERS.** Hit ordinary chassis lubricant and it flies in all directions — leaving parts unprotected.

TUNE IN THE  
TEXACO STAR THEATRE  
EVERY SUNDAY NIGHT  
STARRING JAMES  
MELTON WITH HIS  
GUEST, ED WYNN  
— CBS



# TEXACO

# IT S-T-R-E-T-C-H-E-S

## THE LIFE OF YOUR EQUIPMENT

**T**HIS unique "stretch test" is convincing proof that *Texaco Marfak* has amazing ability to *hold together*. That means it stays where you put it. It won't squeeze out under heavy loads, won't jar out under the hammering of rough service. It also seals out dirt and moisture, protects parts longer.

Contractors everywhere find that *Marfak* gives greater protection with fewer applications. *Marfak*-protected machinery stays on the job longer. Fewer repairs and parts replacements are necessary. Maintenance costs are reduced.

To prolong the life of wheel bearings,

use *Texaco Marfak Heavy Duty*. It forms a protective film inside the bearing, while retaining its original consistency at the outer edges — thus sealing itself in, sealing out dirt and moisture. It gives longer-lasting protection. Requires no seasonal repacking.

*More than 200 million pounds of Marfak have been used to date!*

For Texaco Products and Engineering Service, call the nearest of the more than 2300 Texaco distributing plants in the 48 States or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

# Lubricants and Fuels

## FOR ALL CONTRACTORS' EQUIPMENT

# 2-CYCLE DIESEL TRACTORS



## FASTER—

quick pick-up .. high working speeds .. fast maneuvering .. more trips per shift.



## S-M-O-O-T-H-E-R—

easier on engine and tractor .. more time on the job .. less in the shop.



## START INSTANTLY—

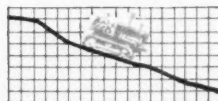
electric starting and operation on Diesel fuel .. go to work quicker.



## LESS SHIFTING—

maintain high torque over a wide speed range .. hang-on in tough going .. less operator fatigue!

... the way of all costs is **DOWN** with Allis-Chalmers 2-Cycle Diesel Tractors...the way of **PROFITS UP!**



### FOUR 2-CYCLE DIESEL MODELS

**HD-7, HD-10, HD-14, HD-14C (Torque Converter)**  
60 to 132 Drawbar H. P.





**put more in the Profit Pocket**

**... take less from the Cost Pocket**



**ALLIS-CHALMERS**  
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

# KOEHRING 605 WORTH MORE IN LIFTING CAPACITY ALONE

At a 12' radius, lifts better than 60,700 honest pounds, (75% rating) based on built-in stability and strength, not heavy counterweight.

## Plus these Extra Values

**Power Clutch Retains "Feel"** — A 10# pull sets big 37" clutches. Heavy hand pull is eliminated. Operator definitely gets "feel" of load, retains accurate control. When lifts call for exceptional accuracy, inserting one set-screw quickly changes to manual clutch.

**Independent Live Boom, Power Lowering Available** — Changing boom reach is safe and easy with 605 independent boom hoist . . . raise or lower while you travel or swing. Power lowering for extra smooth boom control also available.

**High A-Frame Raised and Lowered by Power** — Cut time for clearing under overhead obstructions. Remove two pins, lower and raise by power . . . boom suspension cables stay in place.

**30½  
TONS**

### Exceptional Cable Economy

— Main drum clutch cannot jerk, cannot shock load cable. Boom-hoist drum with extra spooling width cuts cable wear common with long booms. Hoist cable spools over top of large drum . . . better boom clearance, hugs drum closer.



Jib boom extension, shown above, is also available. Second drum permits reeving two hoist lines, using either, one on main boom or one on jib, depending on load and lift desired.



**KOEHRING COMPANY**  
MILWAUKEE 10, WISCONSIN  
*Subsidiaries*  
JOHNSON • KWIK-MIX • PARSONS

**HEAVY-DUTY CONSTRUCTION EQUIPMENT**



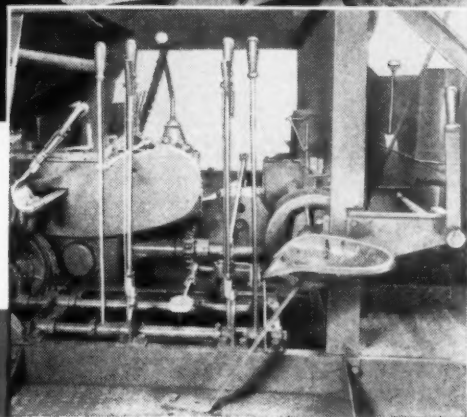
# PARSONS 250 TRENCHLINER

with Centralized one-man controls

One man controls all operations of the Parsons 250 Trenchliner because all operating levers are centrally grouped, every lever within easy reach from the operator's seat. All digging speeds . . . 25 of them, ranging from 2½" to 136" per minute . . . and all 5 conveyor belt and bucket line speeds are controlled by the centrally located, convenient lever bank.



All operating levers are within easy reach of the operator on the Parsons 250 Trenchliner.



**THE PARSONS COMPANY**

*Koehring Subsidiary* NEWTON, IOWA

## *How Big is Your Market for*

**READY-MIXED CONCRETE...**

**TRANSIT-MIXED CONCRETE...**

**CONCRETE PRODUCTS.....**

You analyze the market, determine the volume you want, and Johnson engineers will do the rest.

Because their line is complete, Johnson engineers have available exactly the right combination of bin, batcher, conveying, elevating and storage equipment you need to operate profitably. Investment cost per yard will be low. Volume and quality will be high, because every unit in the complete Johnson line is tops in design and construction.



**THE C. S. JOHNSON COMPANY**

*Koehring Subsidiary*

CHAMPAIGN, ILLINOIS



# See them in action doing your work on your job



See how men work faster with electric tools operated by Homelite Portable generators. Test the capacity, speedy priming and operational advantages of Homelite Pumps on your toughest dewatering job.



There's only one real way to see how well a Homelite Pump handles large volumes, seepage, mud . . . or how easily a Homelite Generator supplies steady current for floodlights, cost-cutting electric tools, communication systems, etc. That way is to get 'em out on the job. Yes, get these handy portable gasoline-engine-driven units out on *your* job and see how they measure up to *your* standards. See how they work for *you*. All you have to do to get a free demonstration . . . the only way to see in advance what you should get for your money . . . is to write to us today. We'll arrange to have a Homelite Representative see you soon.

**Homelite**  
CORPORATION  
Port Chester, New York  
**Portable Pumps  
Generators and  
Blowers**  
GASOLINE-ENGINE-DRIVEN

**NO MORE TROUBLE with  
SYNTHETIC TUBE REPAIRS**

## Good news for Maintenance Men

### NEW INLAND Unit for faster, safer vulcanized tube repairs

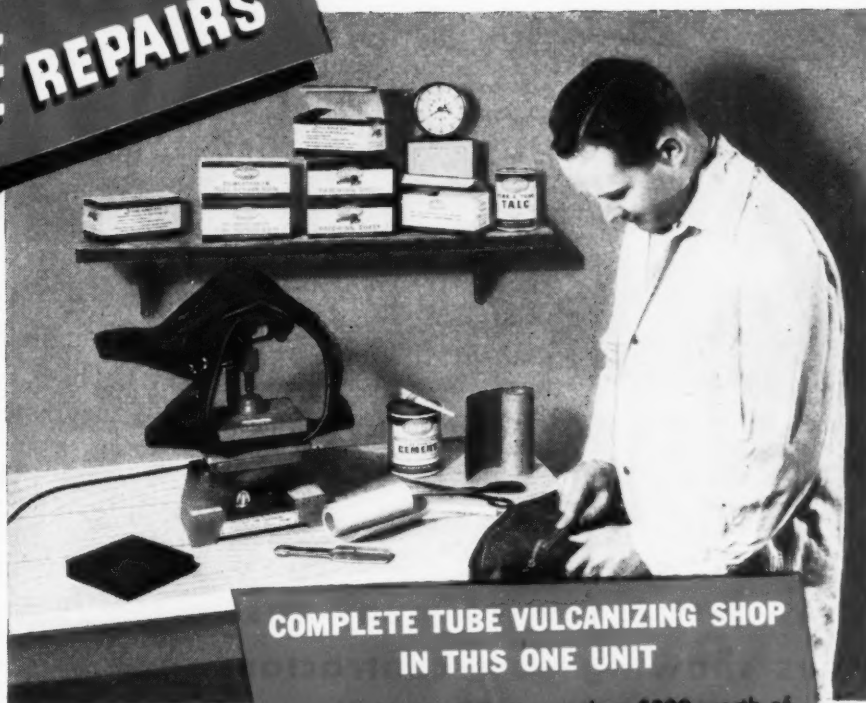
Now! Make *faster* vulcanizing tube repairs right on the job, or in your shop. Keep trucks and all your construction equipment rolling. Tube injuries up to 6 inches long in both natural and synthetic rubber tubes are quickly and economically repaired in one curing with the new Inland Tube Vulcanizing Unit No. 5. Included in this new unit is Inland's famous thermostatically controlled Vulcanizing press PLUS a complete stock of Gum, Vulcanizing Cement, Accessories and Tools. Easy to use—requires very little space. Your Automotive Jobber has No. 5 Units in stock for immediate delivery.

**For both natural and synthetic rubber tubes**  
**Easy to use . . . no experience necessary**  
**Repairs injuries up to 6" long in one curing**  
**Handles valve stem repairs of all sizes**

Get details in  
New Free  
Folder



**INLAND RUBBER CORPORATION**  
Subsidiary of Minnesota Mining & Manufacturing Company  
Branches in thirteen principal cities



#### COMPLETE TUBE VULCANIZING SHOP IN THIS ONE UNIT

Includes Materials for more than \$200 worth of  
vulcanized tube and valve stem repairs



Complete Unit  
only  
**\$62<sup>72</sup>**

#### INLAND RUBBER CORPORATION

33 So. Clark St., Dept. C-66, Chicago 3, Ill.

Please send me free folder on Inland No. 5 Tube  
Vulcanizing Unit.

Address .....

Name .....

Town .....



# *Tough* JOB CONDITIONS

## HANDLED BY TOURNAPULLS

Here are just a few of many case histories showing how contractors have proved Tournapulls' ability to profitably lick the toughest haul, weather and job conditions. With job-proved Tournapulls, you too, can assure lowest-net-cost-per-yard on all your future requirements.

*Tough Footing* . . . 4 Tournapulls loaded gravel in a river bed . . . hauled through the water . . . pulled loaded up a 12% adverse grade from the river . . . and traveled 4000' to a railroad siding where they stockpiled their loads. Rigs are working for Constructores Mexicanos S.A. to supply ballast for a section of railroad near Ixtepec, Oaxaca, Mexico. In these extremely tough off-road conditions the Tournapulls' big 21.00 x 24 tires gave ample traction and flotation . . . 2-wheel design provided plenty of weight on the drive wheels to furnish pulling power to climb the adverse river grades.



FOR A PROFITABLE IDEA OF TOURNAPULL PERFORMANCE ON YOUR JOBS  
ASK YOUR LE TOURNEAU DISTRIBUTOR FOR FACTS AND FIGURES TODAY



**Steep Grades** . . . Nathan A. Moore's Tournapulls loaded and hauled down 40 to 50% grades . . . returned up 27% climb while moving 1/2 million yards from a mountainside at Camp Pendleton, Oceanside, Calif. Material was sandstone, mixed with clay, heavy but dry, rooted for fast loading. Despite mountainous grades and tough materials, Moore's superintendent reports that their Tournapull fleet, working over 1/2-mile, 1-way haul, placed 6,000 yards on the fill every 9-hour shift.



**Rooted Shale** . . . Potts & Callahan Contracting Co., Inc., found what Tournapulls could do in tough rooted shale on Pennsylvania highway job, near Harrisburg. Using 4 Tournapulls on a 700', 1-way haul, each rig averaged a complete cycle of load, haul, spread and return every 3.55 minutes . . . made 14 round trips hourly. By using a LeTourneau Rooter, smart contractors like these are extending low-cost Tournapull operation into materials formerly considered work for specialized equipment.

**Rain and Snow** . . . Talbott & Myers Construction Co.'s 2 Tournapulls licked tough winter conditions on construction of a new General Electric building site at Lexington, Ky. Material was clay—very soggy from several weeks of rain. Next came a 4 1/2" snow storm . . . but Tournapulls proved their ability to keep loading, hauling and spreading. Positive load ejection and big-tired traction and flotation kept rigs rolling through soft, sticky fill. Hauls were short on this job — 525' 1-way; Tournapulls moved 45,000 of total 50,000 yards.



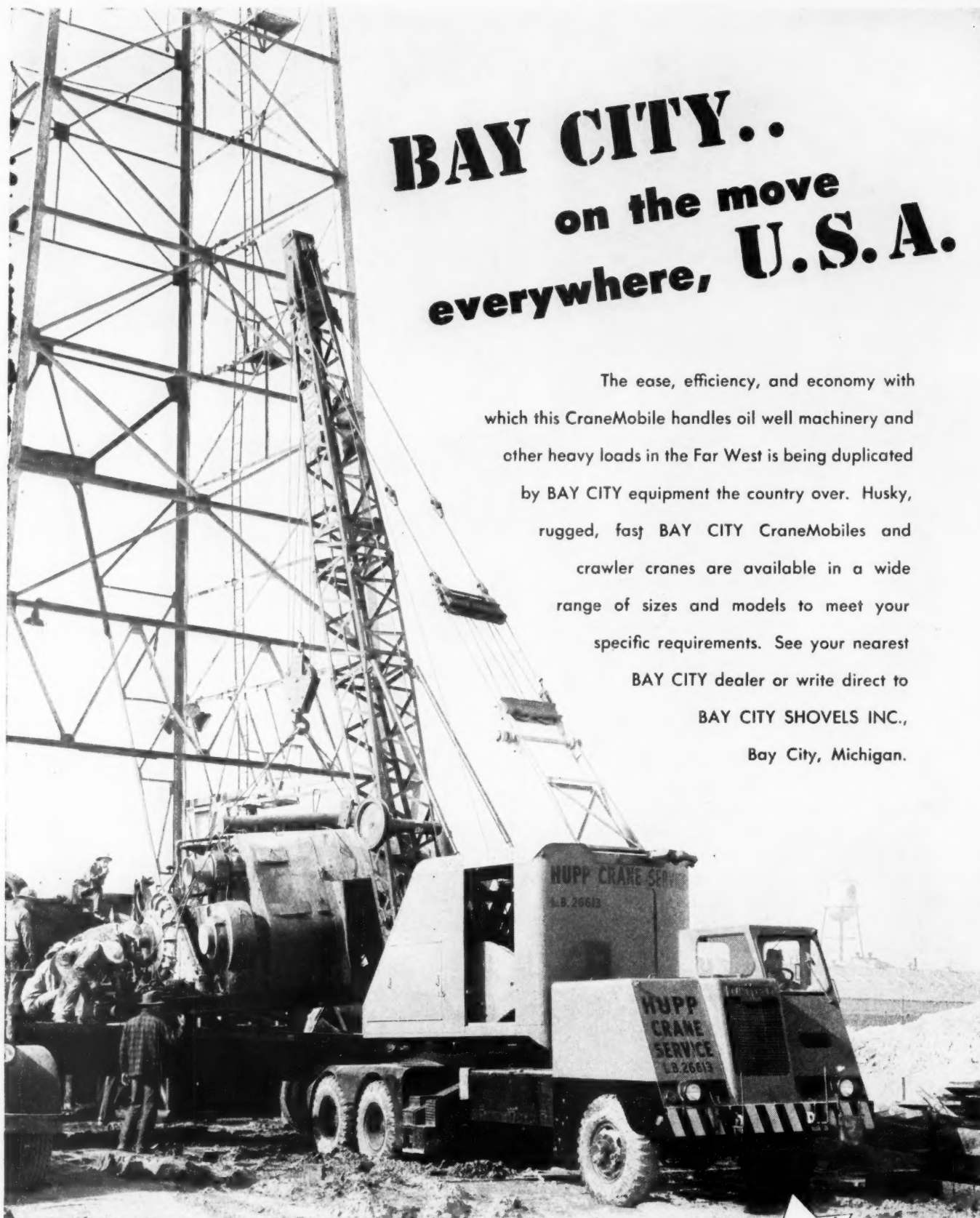
**LETOURNEAU**  
PEORIA, ILLINOIS • STOCKTON, CALIFORNIA



**TOURNAPULLS**  
\* Trade Mark Reg. U. S. Pat. Off. C45

# BAY CITY.. on the move everywhere, U.S.A.

The ease, efficiency, and economy with which this CraneMobile handles oil well machinery and other heavy loads in the Far West is being duplicated by BAY CITY equipment the country over. Husky, rugged, fast BAY CITY CraneMobiles and crawler cranes are available in a wide range of sizes and models to meet your specific requirements. See your nearest BAY CITY dealer or write direct to  
BAY CITY SHOVELS INC.,  
Bay City, Michigan.



## BAY CITY



SHOVELS • DRAGLINES  
CRANES • HOES • CLAMSHELLS



SEE YOUR NEAREST DEALER for Bay City excavating and material handling equipment in sizes from  $\frac{3}{8}$  to  $1\frac{1}{4}$  yards having crane rating up to 20 tons. Both crawler and pneumatic tire mounting.



# 33 SERVICE STATIONS

...ASSURE PROMPT, EFFICIENT SERVICE AT ALL TIMES ON **SKILSAW**

• This nation-wide SKILSAW service organization is manned by expert personnel . . . stocks only genuine factory repair parts. It stands always ready to put your SKILSAW in like-new operating condition in the shortest possible time . . . so that your SKILSAW will be *on the job* more hours . . . making more money for you every hour. If your SKILSAW needs overhauling, contact your distributor for the address of the nearest authorized service station.

SKILSAW, INC., 5033-43 Elston Ave., Chicago 30, Ill.  
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# PORTABLE ELECTRIC SKILTOOLS

MADE BY SKILSAW, INC.

SKILSAWS

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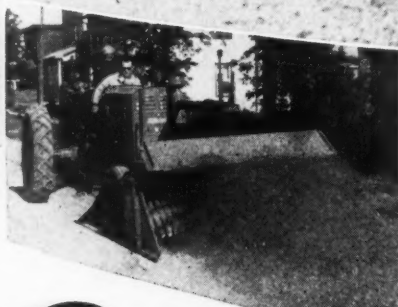
SKILGRINDERS

SKILDRILLS





**TO DRY WET AGGREGATE**



**PIONEERED BY  
SEAMAN**

Use the SEAMAN MIXER for  
Soil Pulverization

★

In-Place Mixing for All Soil  
Stabilization Processes and in  
Bituminous Construction

★

Soil Pulverization to Achieve  
Greater Density in Earth  
Dams, Fills and Levees

★

Seed Bed Preparation for  
Seeding Park Lawns, Road-  
sides and in Landscape  
Operations

**W**HEN sudden rain causes an excess of moisture in aggregate, long and costly drying procedures together with expensive removal and replacement of the material, are eliminated with the SEAMAN MIXER. In fact, many contractors have reported that just in the use of the SEAMAN as a dehydrater alone,—its investment has been amply repaid,—to say nothing of its day-by-day economy in road mixing operations. Operating on the wet aggregate (hood open, of course) the material is thrown high in the air. Mechanical dissipation of moisture due to high velocity is a factor in the consequent dehydration, but the action of air and sun is of even greater consequence.

The same principle applies in the use of the SEAMAN MIXER to remove excess water or solvents from asphalt emulsions on cutback jobs,—thus speeding the set. Finishing and rolling operations can be handled much sooner,—a factor of economy in total production made possible only to a SEAMAN owner.

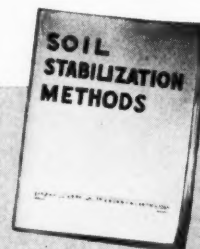
C-118

**The SEAMAN MIXER**  
**SEAMAN MOTORS**

305 N. 25th Street

Milwaukee 3, Wis.

NEW! MORE COMPREHENSIVE  
THAN EVER. A newly compiled  
edition of the popular book  
"Soil Stabilization Methods" is  
just off the press. Send for your  
copy. Ask for Bulletin C-25



# For Absolute Uniformity...



## HAZARD LAY-SET *Preformed* WIRE ROPE

**D**ID YOU KNOW that the preforming process stepped up wire rope quality all along the line? To make preformed rope the manufacturer has to hold to close tolerances, exercise precise controls. That fine precision has made *all* wire rope, preformed or non-preformed, better than it was prior to the advent of preforming. Hazard has had long experience in these exacting methods. That is why Hazard LAY-SET Preformed, as well as Hazard non-preformed ropes, is uniform—reel after reel. Buy Hazard, and you get uniform quality—now and always. Buy Hazard LAY-SET Preformed Wire Rope made of Improved Plow Steel.



### ACCO

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Tacoma, Seattle, Bridgeport, Conn.



### HAZARD WIRE ROPE DIVISION AMERICAN CHAIN & CABLE

*In Business for Your Safety*



## *It Takes Time To Produce Good Equipment*

### **Contractors: Order the equipment you need NOW! Be ready to handle construction at a profit**

Factories are speeding production in an effort to supply the construction equipment needed to handle the work which lies ahead. The contractors who are properly equipped with the necessary machinery and tools are the ones who will complete their contracts most profitably.

Practically every contractor needs construction equipment of one type or another . . . and when you buy equipment, LET C.I.T. FURNISH THE MONEY. Conserve your operating funds for supplies, pay rolls, all of the expenses necessary to operate freely. Spread the cost over many months . . . let the equipment help pay its own way out of earning capacity.

*To finance purchases of equipment this is all you need to do:* Select whatever equipment you need . . . several pieces can be financed at one time . . . agree with the sellers on prices and terms . . . then give C.I.T. the seller's name, types of equipment purchased, tell us the amount to be financed and how you want to pay for it.

We will attend to all further details and when the equipment is ready for delivery, a C.I.T. check will conclude the transaction. You will obtain prompt action and will be quoted a uniformly low rate for the use of our funds.

*Any of these offices are at your service. Write, wire or call.*

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NEW YORK

660 Market Street  
SAN FRANCISCO

333 N. Michigan Avenue  
CHICAGO

416 West 8th Street  
LOS ANGELES



*In Canada: CANADIAN ACCEPTANCE CORPORATION Limited, Metropolitan Building, Toronto, Canada*

**AFFILIATED WITH COMMERCIAL INVESTMENT TRUST INCORPORATED**



# AIR PLUS JAEGER COMPRESSOR

here's one cost  
that's lower...

## JAEGER AIR

Pre-war dollars never bought compressed air as cheaply as you now produce it with a Jaeger AIR PLUS.

**Lower fuel cost:** Precision built and balanced, with positively leak-proof valves of twice the usual size and the latest type Continental, International or Caterpillar power, these units deliver full rated capacity of air with less effort and lower fuel consumption than any compressor you have ever operated.

**Lower cost of upkeep:** Compressor unit and engine are both built to the same standards, with interchangeable parts, force feed lubrication and advanced engineering thruout. Jaeger's "ultra lapped" valves, for example, operate indefinitely without carbon and for 10 times the usual length of life. Clutch, main bearings, truck, frame, etc, are designed for lifetime service on the most rugged work.

**Extra years of service — a major saving in replacement cost:** In addition to the long-life service of America's finest makes of gasoline or diesel engine, Jaeger gives you a compressor unit that operates at slower piston speeds and cooler temperatures than others and will outlast its original power plant, plus a second, AND A THIRD.

Why buy an obsolete Compressor when you can get a modern, more dependable, more economical Jaeger? Sizes 60 to 500 ft. Sold and serviced in 120 cities. Ask for Catalog JC-5.

### THE JAEGER MACHINE COMPANY

Main Office and Factory: Columbus 16, Ohio

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## JAEGER

*Engineered* EQUIPMENT

JAEGER-LAKEWOOD SPREADERS, FINISHERS AND BITUMINOUS PAVERS, FORMS, FORM TAMPERS—"DUAL-MIX" TRUCK MIXERS, AGITATORS—JAEGER HOISTING ENGINES, TOWERS



"FLEET-FOOT"  
Loaders



"SPEEDLINE"  
Concrete Mixers



"SURE PRIME"  
Contractors Pumps



*Look to*

**P&H**

**THIS 2-YD. EXCAVATOR  
can be shipped without dismantling**

P&H Model 855-B! A full 2-yd. machine that's much easier to transport. You don't have to dismantle and re-assemble when you change job locations.

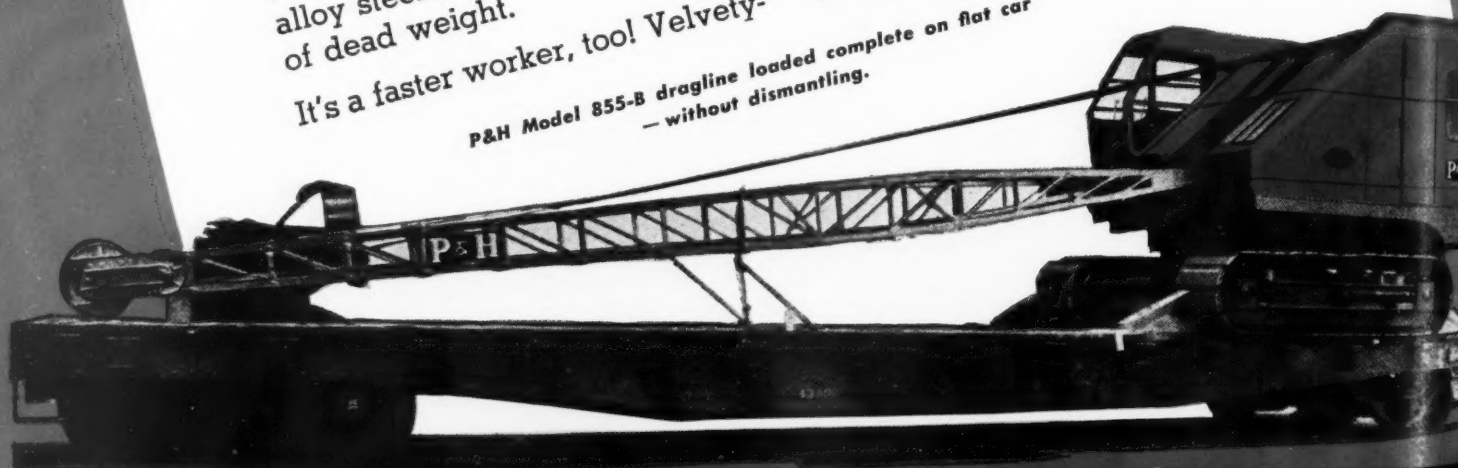
In addition, it's husky, compact, welded throughout of rolled alloy steels, without the penalty of dead weight.

It's a faster worker, too! Velvety-

smooth low pressure hydraulic control is more responsive, more accurate, more dependable.

Here's the larger capacity you need to speed production, cut costs, on all kinds of jobs. It's fully convertible for service as shovel, dragline, crane, clam-shell and pile driver. Ask for all the facts about its added values.

**P&H Model 855-B dragline loaded complete on flat car  
— without dismantling.**

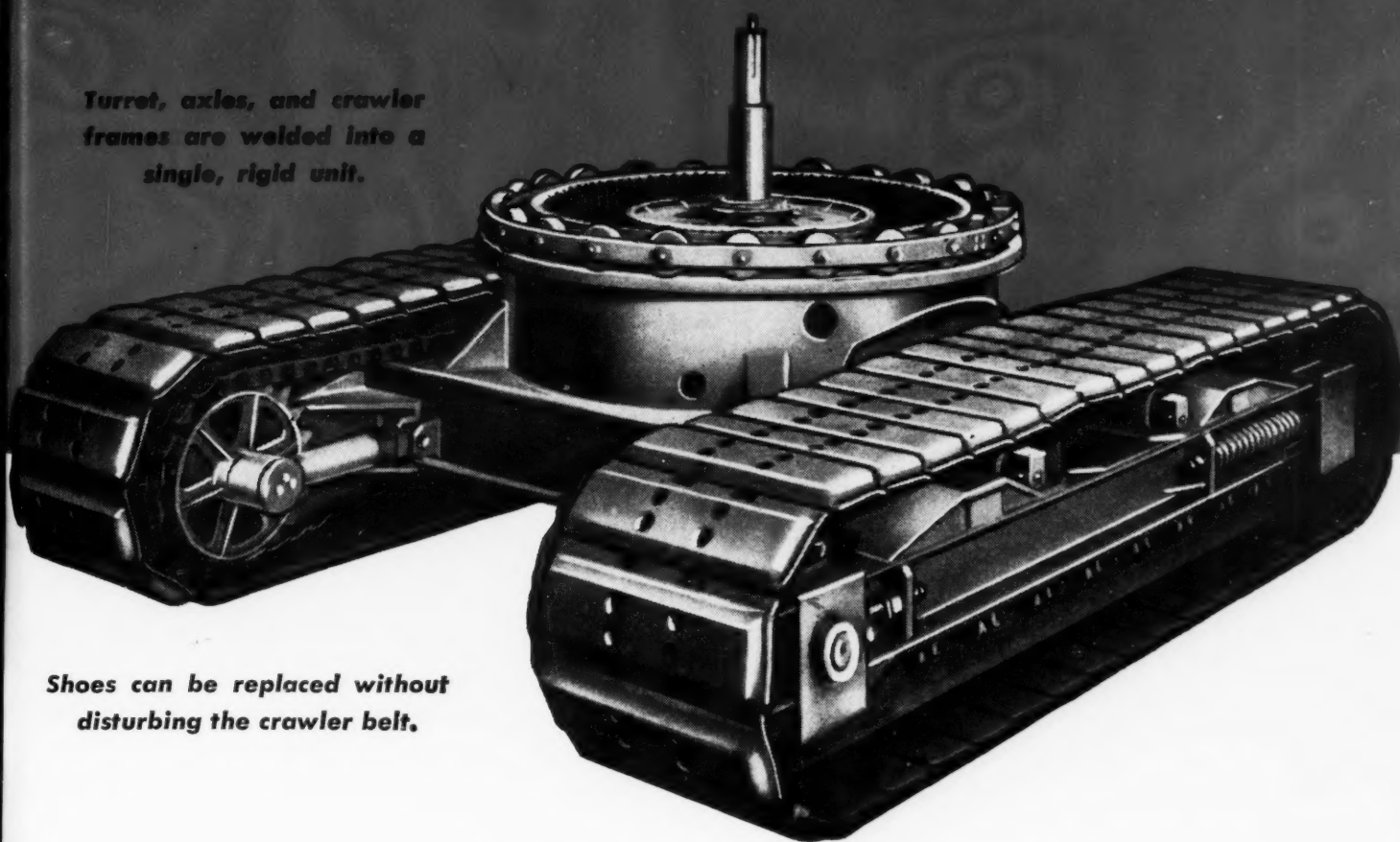




# *for* **ADDED VALUES**

## **THE *Only* 2-YD. EXCAVATOR WITH TRUE TRACTOR TYPE CRAWLERS**

*Turret, axles, and crawler  
frames are welded into a  
single, rigid unit.*



*Shoes can be replaced without  
disturbing the crawler belt.*

Here's travel-ability never known before in a machine of this size. These true tractor type crawlers, the kind that have proved themselves in millions of miles of service, put an end to the usual traction troubles; reduce layup time. They're ready to travel under all ground conditions—in sand, gravel, deep mud—or over hard surfaces. Compensator springs keep crawler belts at proper tension, always. Maintenance costs are lower than for any other type of crawlers.

Maneuvering is easier, too. With P&H's easy steering, you can make gradual turns, sharp turns, or right-about-face without stopping. Independent double act-

ing hydraulic brakes positively lock the machine against movement while digging.

You'll find still more added values in these new P&H's, such as rapid reversing planetary chain crowd for greater accuracy, longer life; live roller circle for faster, easier swings; double hook rollers which eliminate teetering under heavy loads. And for crane service, independent planetary boom hoist and planetary lowering device which permits the accurate "inching" of loads. They'll save you money now in faster production. And they'll save you repair bills for years to come.

# **P & H**

## **EXCAVATORS**

4494 West National Avenue  
Milwaukee 14, Wisconsin

## **HARNISCHFEGER**

**CORPORATION**

EXCAVATORS - ELECTRIC CRANES - ARC WELDERS - **P&H** HOISTS - WELDING ELECTRODES - MOTORS

*P&H Excavators are built in sizes up to 6 cu. yds. capacity, gasoline, Diesel or electric power. Write for literature on the size you need.*





## Joe can really "chute the works" with that new Rex!

And no wonder! For the new Rex Mixer is designed to allow any operator to turn out more batches per day . . . with far less manual effort!

Take, for example, the discharge chute. It's outside the drum during mixing and when it's time to discharge, the operator just gives an easy-operating hand lever a push and swings the chute into the drum. Contrast this with the ordinary chute that's inside the drum during

the mixing. The operator not only has to lift the chute but a chute-full of concrete as well when the batch is ready to discharge. Think of the extra wear and tear on that chute in addition to the strain on the operator.

For all the facts, see them at your Rex Distributor, or if you prefer, send for your free copy of Catalog No. 480. Address Chain Belt Company, 1634 W. Bruce St., Milwaukee 4, Wis.



CHAIN BELT COMPANY of MILWAUKEE

CONSTRUCTION MACHINERY



PUMPS



PAVERS



PUMPCRETES



MOTO-MIXERS



MIXERS

# Smooth Rolling

## WITH DEPENDABLE LE ROI POWER

... the same smoothness you enjoy with leading makes of other construction equipment such as cranes, mixers, hoists, etc., which are equipped with heavy-duty Le Roi engines. Look for the Le Roi trademark before you buy ... it pays! Write for latest bulletins.

**Le Roi Company • Milwaukee 14, Wisconsin**  
NEW YORK • WASHINGTON • BIRMINGHAM • TULSA • SAN FRANCISCO



TURN THE PAGE



# LE ROI "60"

**Big Compressor Value in a Small Package—Plus  
Extra Compactness, Extra Mobility, Extra Economy,  
Extra Maneuverability . . . .**

You want to make a profit on the little jobs, too . . . and LE ROI 60 is a big help. Experienced users find it strong and rugged — with plenty of reserve power. Unit construction, quality valve-in-head engine, electric starting, and many other features are included as standard equipment. When you need a 60-foot compressor that cuts "dead" time and gives you more working time, ask for LE ROI 60.

*See your nearby Le Roi distributor.*

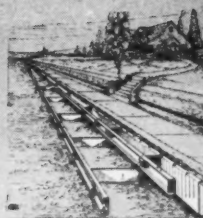
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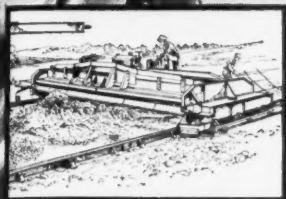


FAST... LOW COST  
STREET PAVING WORK

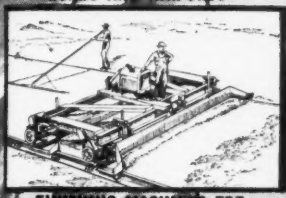


with  
*Blaw-Knox*

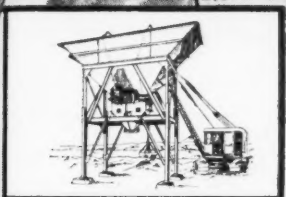
**STEEL**  
(UNIVERSAL)  
**FORMS**



PAVING SPREADERS FOR  
ROADS AND AIRPORTS



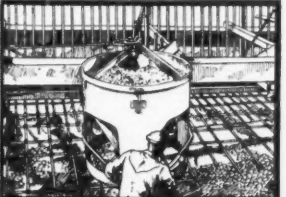
FINISHING MACHINES FOR  
ROADS AND AIRPORTS



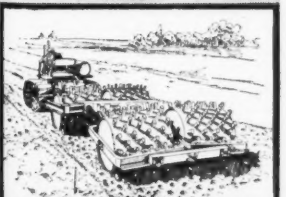
AGGREGATE  
BATCHING PLANTS



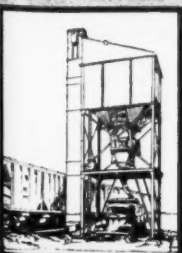
CLAMSHELL  
BUCKETS



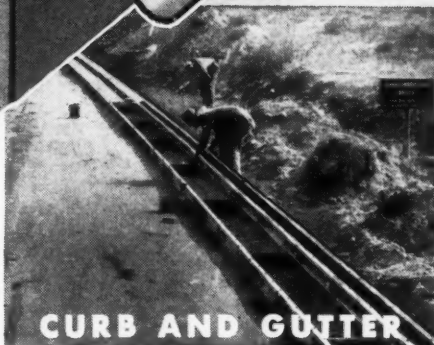
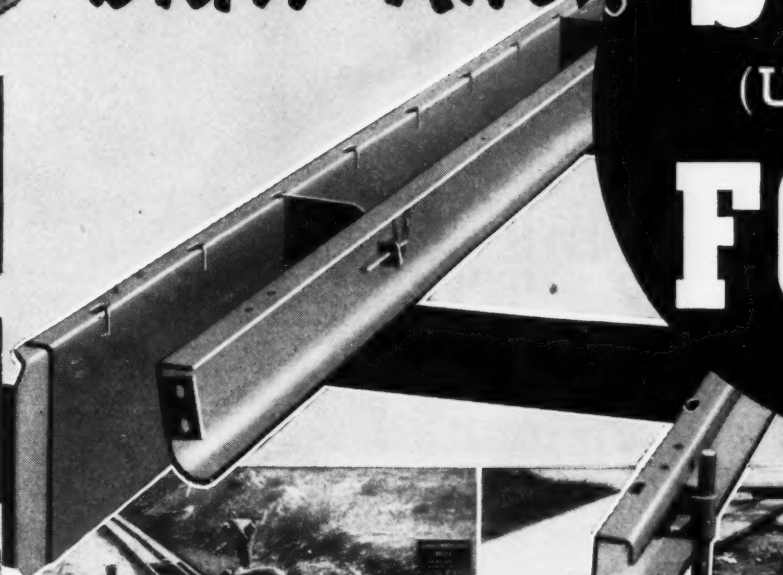
CONCRETE  
BUCKETS



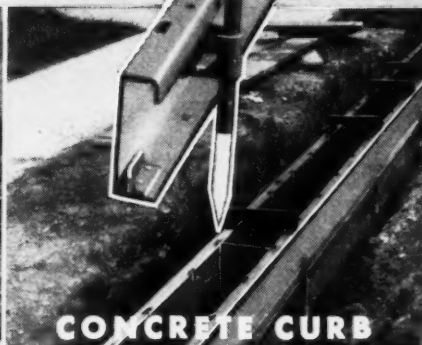
SHEEPSFOOT TAMPING  
ROLLERS



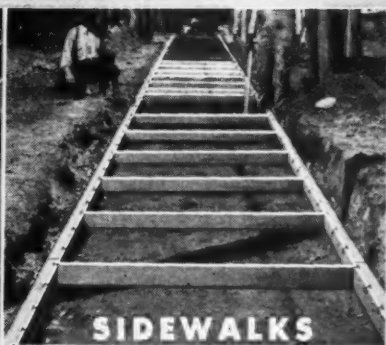
BULK  
CEMENT  
PLANTS



CURB AND GUTTER



CONCRETE CURB



SIDEWALKS

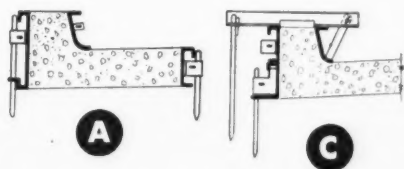
From municipal paving — to real estate development — or for the occasional paving job.

BLAW-KNOX STEEL FORMS give a high dollar return value. Thousands of contractors use Blaw-Knox Steel Forms for a great variety of work. Any design of concrete curb; curb and gutter; integral curb; sidewalk, etc., can be handled with standard Blaw-Knox form set-ups.

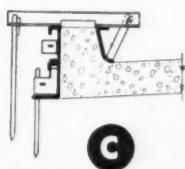
Easy to handle and use, they will do street paving work quicker and cheaper. The steel imparts a smooth finish to the concrete, eliminating the hand finishing always necessary when expensive wooden forms are tediously built for each job.

Blaw-Knox Steel Forms are built for long service, quick installation and dismantling; and are rigidly braced to hold their position when being filled with concrete.

Always ready for action — to use again and again.



A



C



D



H



I



K



N



M

USE THIS COUPON

BLAW-KNOX DIVISION of Blaw-Knox Company  
2086 Farmers Bank Building, Pittsburgh, Pa.

Send Prices on \_\_\_\_\_ Lineal Feet of \_\_\_\_\_

Send a Copy of  
Blaw-Knox Catalog No. 1859 ☐ Set-up \_\_\_\_\_  
(A, B, C, etc.)

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

Now clean up  
engines without  
tearing them down

**STANO-PURGE**

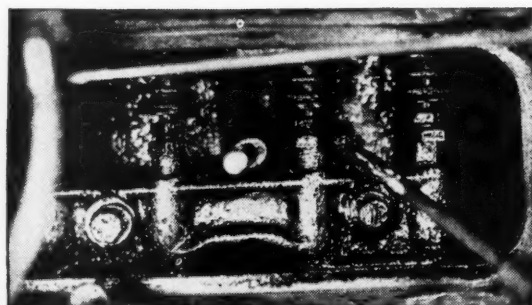
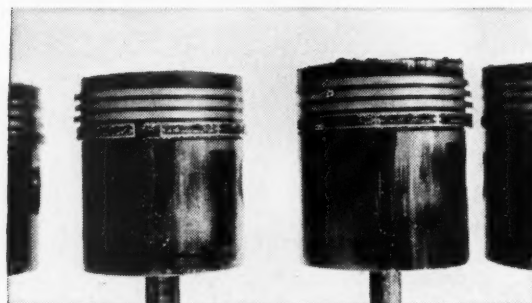
HAVE YOU frequently wished for a really effective crankcase purging solvent? For example, when you know an engine is sludged but can't be spared for tearing down and cleaning? Or when delivery units, operating intermittently or with considerable idling, are sludging badly?

Stano-Purge will clean the crankcase, piston rings, oil screen and lines, and valve chamber. Only in cases when engines are extremely dirty and the oil screens badly clogged will it be necessary to drop the pan.

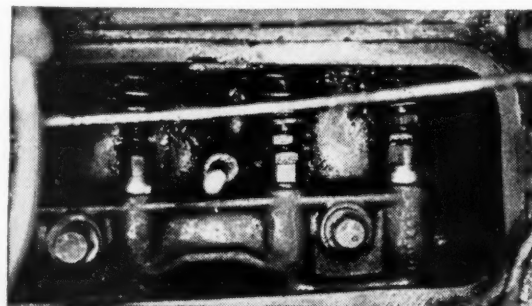
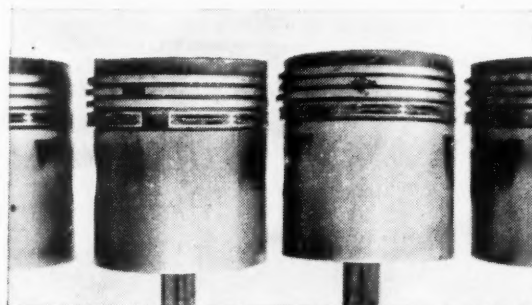
Stano-Purge has been thoroughly tested on many makes of gasoline engines. Some of the remarkable results are pictured here. Its effectiveness is the result of unusually high solvency and a detergent additive developed by Standard Oil. These properties combined with a high foaming action enable Stano-Purge to remove engine deposits.

A folder is available describing the application of Stano-Purge and further advantages. Send for a copy. Write the Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

*Before* **STANO-PURGE**



*After* **STANO-PURGE**

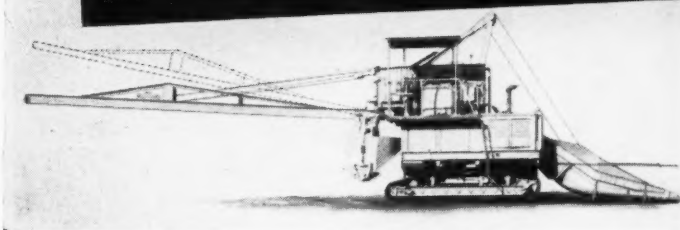


**STANDARD OIL COMPANY (INDIANA)**

**STANDARD  
SERVICE**



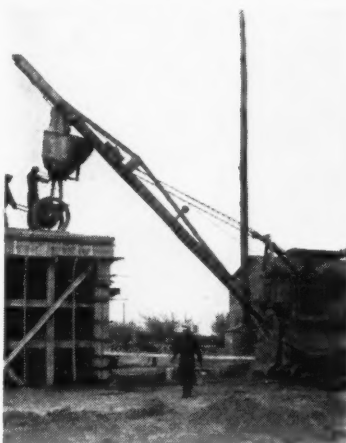
# Let's Get the Terms Straight!



## MULTIFOOTE STANDARD BOOM

Both single- and double-drum MultiFoote 34-E Pavers are equipped for raising and lowering the boom by power to pour low elevation headwalls, abutments, retaining walls and the like. This boom is *not* extra-cost equipment, but is equal to or better than similar booms, sometimes called "live," "angle," "slope," or "inclined."

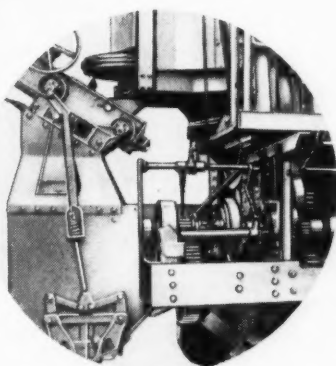
## MULTIFOOTE ELEVATING BOOM



Special equipment on a MultiFoote Paver to get full-load pouring up to 18½ feet above ground level. Extra heavy clutch and hoisting mechanism to handle fast bucket travel with boom elevations up to 40°. . . *There is no other paver boom like this*, no matter what the terminology may be. Available for all MultiFoote 27-E and 34-E Single- and Double-drum Pavers.

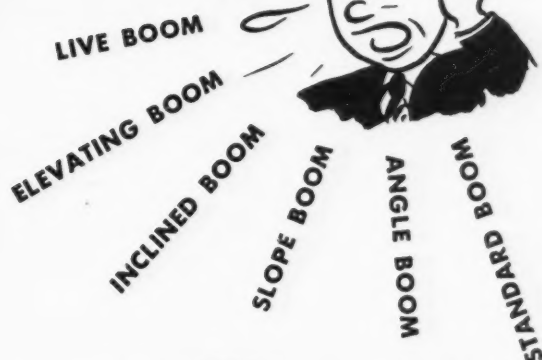
## The Differences are Here

*Right*—The special MultiFoote Elevating Boom hoist mechanism. Over-size brake, clutch and hoist drum to haul up full loads on steeply elevated boom with the same MultiFoote dependability you expect from the rest of the machine.



## . . . and Here

*Left*—Special bucket with brackets to allow leveling bucket on elevating boom. Bucket doors can be operated from paver platform, or by special hand release at the bucket.



## ...on Concrete Paver Booms

**LET'S** get the terms straight! Powered raising and lowering paver booms are called by too many names . . . And the confusion could be costly to you. There are two different powered MultiFoote Paver booms, which are described here. In telling you what they are and what you can expect of them on your jobs, we hope to clear up any possible question about Foote standard and elevating booms. Naturally, we think the MultiFoote is the best all-around paver available . . . And you road-builders back us up by putting more of them on the job than any other paver. For complete data on all new MultiFoote models, see your MultiFoote Distributor or write us direct.

**THE FOOTE COMPANY, INC.**  
1936 STATE ST., NUNDA, NEW YORK

# MULTIFOOTE

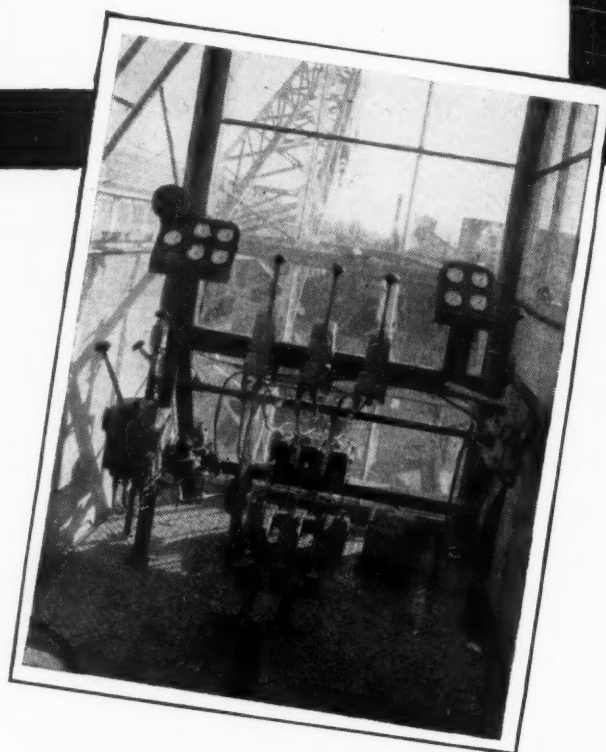
27-E and 34-E Single Drum  
34-E DuoMix (dual drum)

## Concrete Pavers





**Enginairing  
simplifies  
command in this  
WASHINGTON  
CRANE**



This new diesel powered, mechanical drive crane, built by Washington Iron Works for barge mounting, features two important contributions to more efficient control.

The elevated cab gives the operator a better field of view. And W·A·B Enginaired Controls give finger-touch command of every motion.

The view of the cab shows a 3-way control valve on the left hand side which controls both slew motions and slew brake. The valves in center, operated by hand levers and pedals, control clutches, pawls and brakes on the topping, main hoist, and whip drums. The power take-off clutch and the throttle control are to the right.

W·A·B Controls eliminate the "muscling" of heavy levers, reduce operator fatigue and contribute to safe operation. Maintenance is reduced as there is no mechanical linkage to develop play. When you buy new cranes, be sure to specify W·A·B Controls for top performance.

**WESTINGHOUSE AIR BRAKE COMPANY**

INDUSTRIAL DIVISION • WILMERDING, PA.



PNEUMATIC CONTROLS



AIR COMPRESSORS



WABCO PACKING

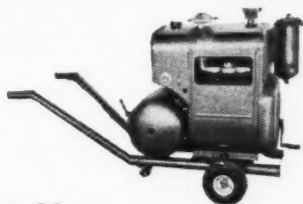


*Run your eye over this wide  
range of*

# SCHRAMM

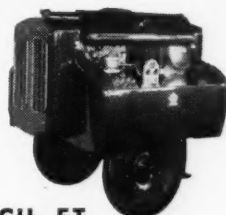
## AIR COMPRESSORS

**SIZES FROM 20 TO 420 CU. FT. ACTUAL AIR**



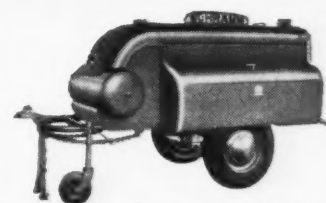
**No. 20  
ON SHOP TRUCK**

The No. 20 compressor is a complete self-contained unit available in various types of mountings and with an actual air delivery of 20 cu. ft. per minute.



**60 CU. FT.  
DE LUXE WITH TOOL BOXES**

The two wheel trailer type mounting is designed for rapid and inexpensive transportation behind truck or car.



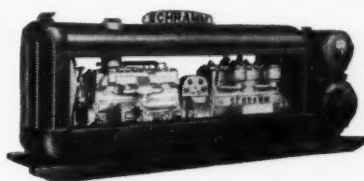
**105 CU. FT.  
WITH SWIVEL TYPE WHEEL**

This trailer type mounting is provided with a universal coupling or towing ring for connection to car or truck for hauling at maximum towing speed.



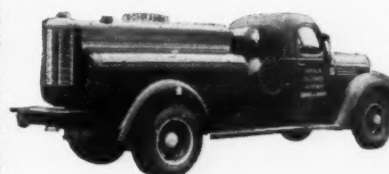
**105 CU. FT. WITH STREAMLINE  
FUEL TANK**

A pneumatic tired mounting used generally for rapid transit over town and country highways. Lighter weight and better balance provide easier handling.



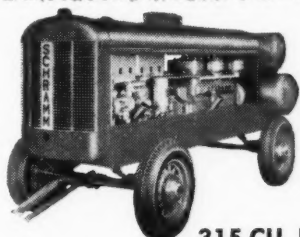
**210 CU. FT.  
STANDARD SKID MOUNTED**

This unit is easily loaded on to a motor truck body for temporary use or for transportation, and can also be used for temporary or permanent stationary installation without addition of foundation.



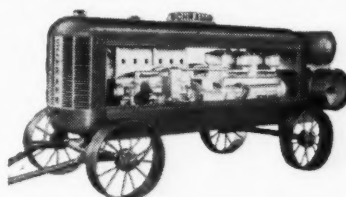
**210 CU. FT.  
MOTOR TRUCK MOUNTING**

Any of the Standard self-aligned Schramm compressor units complete with streamline tool box and built-in fenders are available for mounting on truck chassis.



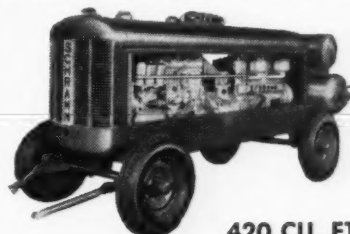
**315 CU. FT.  
ON SPRING TRAILER**

The Spring Trailer, with pneumatic tires and semi-elliptical springs front and rear, is equipped with an automotive type steering assembly to provide perfect balance on any and all turns.



**STEEL WHEEL MOUNTING**

All size Schramm compressors are available in this type mounting with heavy, wide steel rims for easy portability in tough terrain.



**420 CU. FT.  
DIESEL ENGINE DRIVEN**

Schramm Diesel Engine Driven units are available in sizes ranging from 105 to 420 cu. ft. of free air.

# SCHRAMM INC.

**COMPRESSOR SPECIALISTS  
WEST CHESTER  
PENNSYLVANIA**

**"OPERATOR FATIGUE"**  
*Banished forever!*



Comfortable Seat for Operator

**AS EASY AS DRIVING A CAR**

Link-Belt Speed-O-Matic Control assures maximum speed and output from shovel-cranes-draglines. The operator is completely relaxed in his seat at all times. Operation is as simple as driving an automobile.

**POWER CONTROL VS. MANUAL OPERATION**

Speed-O-Matic Hydraulic Control does two things: it removes operator fatigue and increases the operating speed of the machine. For example, the use of this control increases the output of the machine and reduces fuel consumption.

**RELEGATES BACK-BREAKING LEVERS TO THE HORSE AND WAGON DAYS**

No longer does the operator "fight" a shovel-cranes-dragline. The operator is completely relaxed in his seat at all times. Operation is as simple as driving an automobile. The operator is completely relaxed in his seat at all times. Operation is as simple as driving an automobile.



**LINK-BELT**  
*Speed-O-Matic*  
**EFFORT-LESS CONTROL**  
**FOR SHOVELS-CRANES-DAGLINES**

- ★ MAINTAINS TOP EFFICIENCY
- ★ SPEEDS UP THE JOB
- ★ INCREASES OUTPUT
- ★ REDUCES COSTS

**ANOTHER LINK-BELT ACHIEVEMENT**

Link-Belt Speed-O-Matic Control does in four years what other Link-Belt engineering achievements in hydraulic the same revolution. Development since the introduction of the control saving time and money. Not only does this patented control reduce maintenance and machine efficiency, but because of its simplicity, the maintenance is reduced. There are no moving parts in the hydraulic mechanism is self-adjusting and practically all of the parts which cause the most trouble in the current Link-Belt hydraulic systems are eliminated.

**AMAZING RESULTS ASSURED**

Speed-O-Matic Hydraulic Control results in output an 80% increase that claim based on actual data would appear exaggerated. A small description is necessary to an appreciation of the amazing results that are now available.

**PROVED IN THE FIELD**

Link-Belt Speed-O-Matic Control is everywhere. After nearly four years of development work, and extensive tests in the field, the Link-Belt Speed-O-Matic Control is now in use on all Link-Belt shovel-cranes-draglines. A comparison of the results of Speed-O-Matic Control with those of Link-Belt hydraulic control shows that the Link-Belt Speed-O-Matic Control is now in use on all Link-Belt shovel-cranes-draglines. A comparison of the results of Speed-O-Matic Control with those of Link-Belt hydraulic control shows that the Link-Belt Speed-O-Matic Control is now in use on all Link-Belt shovel-cranes-draglines.

This bulletin announcing Speed-O-Matic Hydraulic Control was first published in 1936, 10 years ago.



*Speed-O-Matic*

**TOPS ALL BETS!**

**PERFORMANCE BEATS CLAIMS MADE 10 YEARS AGO**

Speed-O-Matic Hydraulic Control on Link-Belt Speeder "shovel-cranes" has passed its first 10-year milestone . . . ahead of schedule!

. . . 10 years ago we believed this development would mark a new era in power shovel design; that it would assure greatly increased output; and abolish "operator fatigue."

. . . Today our expectations have been exceeded by results. Reports from every part of the country show increased outputs of 25% or more regularly.

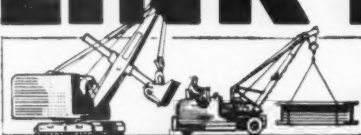
Replacing human muscle with positive hy-

draulic pressure eliminates lost motion in operating clutches and brakes, saving minutes in every hour; reduces wear and tear on machine parts, and by eliminating effort and fatigue, enables the operator to deliver capacity yardage right up to the last minute of the shift.

Speed-O-Matic demonstrates Link-Belt Speeder's leadership in engineering and building shovels, cranes, draglines which will do more work, more kinds of work, more of the time!

For Prompt, Efficient, Convenient Sales and Service:  
There is a Link-Belt Speeder Distributor Located Near You

**LINK-BELT SPEEDER**



*Builders of the Most Complete Line of*  
**SHOVELS-CRANES-DAGLINES**



**LINK-BELT SPEEDER CORPORATION, 301 W. PERSHING ROAD, CHICAGO-9, ILL.**  
(A DIVISION OF LINK-BELT COMPANY)





*THE "Ounce of Prevention"*

*THAT WASN'T THERE...*

## **Fire Chief Canvas . . . could have prevented this fire.**

An overturned salamander . . . live sparks falling on a canvas tarpaulin . . . the untreated canvas ignites and disaster follows.

With Fire Chief Finished canvas it would have been different. Fire Chief will not support combustion. The canvas may char a little where the spark contacts it, but will not flame, soon goes out.

On all construction work, the few extra cents for Fire Chief Finished Canvas is cheap in-

surance . . . soon repaid by longer use, for Fire Chief is water, weather, mildew and wear-resistant, too.

Wherever flammable canvas presents a hazard, specify Fire Chief. Approved by both the Underwriters Laboratories and the Associated Factory Mutual Fire Insurance Companies.

**WM. E. HOOPER & SONS CO.**  
New York PHILADELPHIA Chicago  
Mills: WOODBERRY, BALTIMORE, MD.

*Fire-Chief Finished* (PATENTED)

**HOOPERWOOD COTTON DUCK**

# MUFFLE THAT BLAST

Get Better Breakage, Too



## with **ATLAS ROCKMASTER**

There's something unique and different in explosives for construction work—a *whole new system of blasting* that amazingly reduces vibration and concussion . . . that has almost totally eliminated complaints about noise. The name of this system is the Atlas Rockmaster. It's the first really important blasting development since the war.

Built on a delayed-action principle that keeps the gases of the explosive working longer behind the burden, Rockmaster not only muffles the effects of concussion *but also increases rock fragmentation*. Many superintendents report that breakage is improved from 30% to 50%. Even in heavily settled areas operators have been able to shoot more holes—at less expense—with fewer complaints from neighbors.

The effects of Rockmaster blasting have to be seen and heard to be believed. If Rockmaster is being used in your area, make it a point to check on what it will do. Or call in our Atlas representative and let him show you how it will save you time, labor and money. Remember, Atlas Rockmaster also gives you

*the greater safety of*  
**ATLAS MANASITE  
DETONATORS**

### *Check These Features*

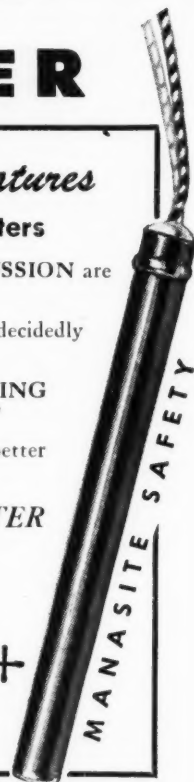
#### **Reported by Blasters**

- ✓ "NOISE AND CONCUSSION are drastically cut down"
- ✓ "ROCK BREAKAGE is decidedly more complete"
- ✓ "SECONDARY BLASTING is reduced to a minimum"
- ✓ "OVERBREAK can be better controlled"

*Identify the ROCKMASTER  
by the Blue Color*

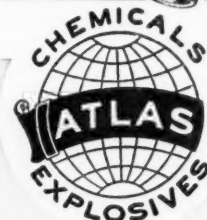


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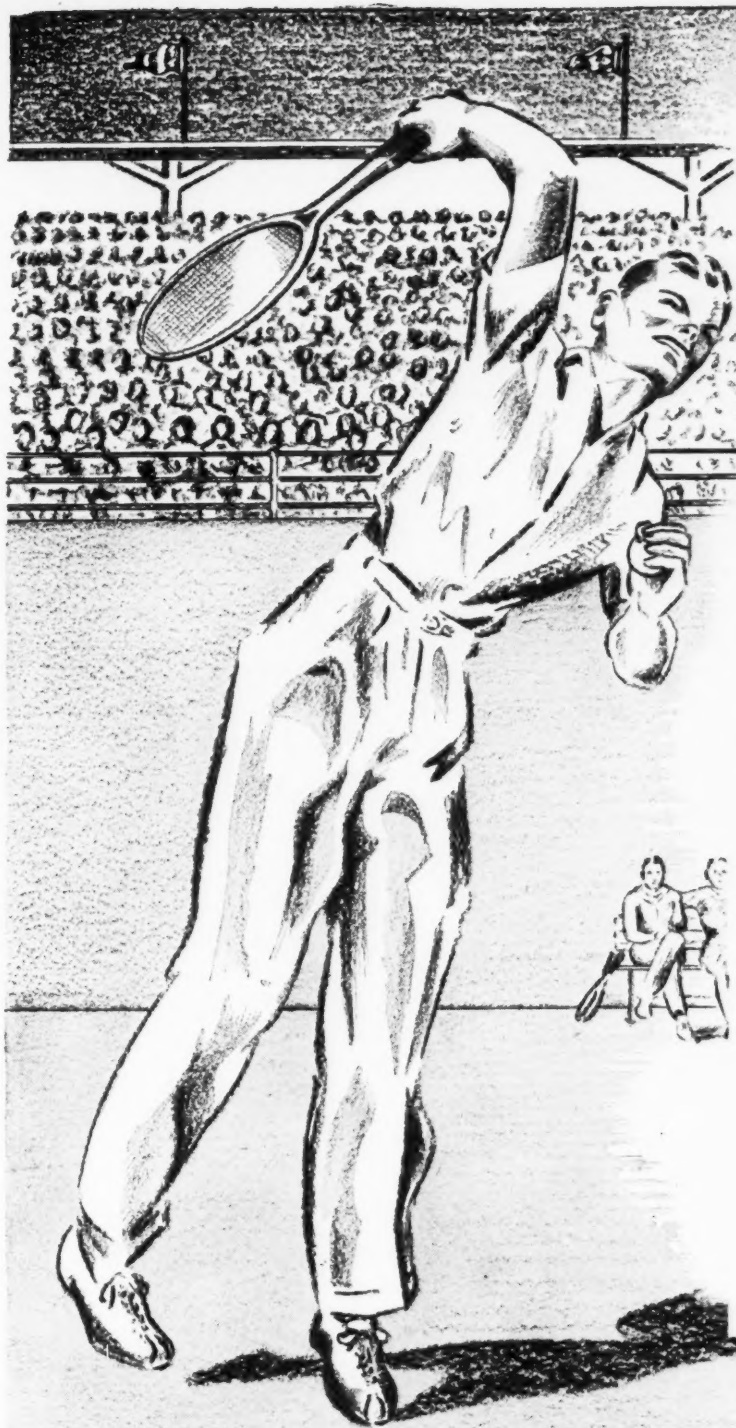
# ATLAS

EXPLOSIVES  
"Everything for Blasting"



ATLAS POWDER COMPANY, Wilmington 99, Del. • Offices in principal cities • Cable Address—Atpowco





*Like the*  
**WINNING STROKE**

**"HERCULES"**  
RED-STRAND  
REG. U.S. PAT. OFF.  
**WIRE ROPE**

*always comes through*  
*on* **TOUGH JOBS!**

It takes stamina, flexibility and dependable performance if the tennis player is to come through to victory.

Industry, too, calls for the same qualities in Wire Rope if the tough jobs are to be done successfully. That's why so many Wire Rope users have turned to "HERCULES" (Red-Strand) — they have learned by repeated tests that it can be depended on...even in emergencies.

As "HERCULES" is made in a wide range of types and constructions, there is—in this one grade—a right rope for every heavy duty purpose.

HAVE YOU TRIED  
**Preformed**  
**"HERCULES"**  
RED STRAND  
**WIRE ROPE**  
—?—  
IT'S TOPS AS  
A  
**MONEY SAVER**

MADE ONLY BY

**A. LESCHEN & SONS ROPE CO.**

WIRE ROPE MAKERS  
5909 KENNERLY AVENUE

NEW YORK 6 . . . 90 West Street  
CHICAGO 7 . . . 810 W. Washington Blvd.  
DENVER 2 . . . 1554 Wazee Street



ESTABLISHED 1857  
ST. LOUIS 12, MISSOURI, U. S. A.

SAN FRANCISCO 7 . . . 520 Fourth Street  
PORTLAND 9 . . . 914 N. W. 14th Avenue  
SEATTLE 4 . . . 3410 First Avenue South



# How **BG** *Bucket Loaders* screen to size while loading..

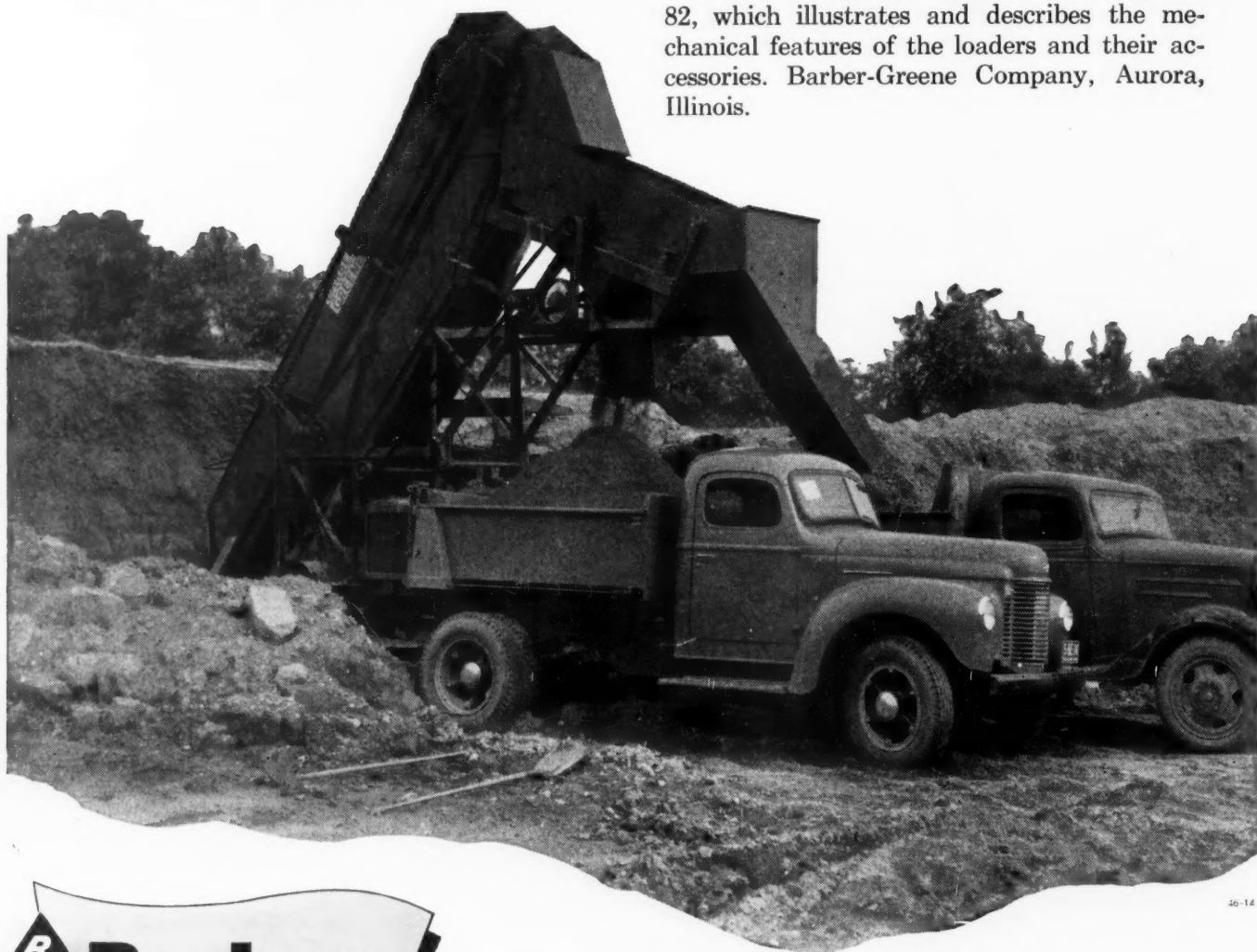
• Screening and loading become one continuous operation with the Barber-Greene Bucket Loader. One machine and one operator do the entire job. The double deck vibrating screen operates right on the loader and moves with the loader, requiring no change of set-up as the working face progresses.

In addition, bank run material is loaded at the time and in the quantities actually needed.



There are no piles of screened material scattered around to be run over by trucks and lost.

Barber-Greene Bucket Loaders, built in several different models and sizes, are designed to operate with scalping and vibrating screens and other accessories. Write for Catalog No. 82, which illustrates and describes the mechanical features of the loaders and their accessories. Barber-Greene Company, Aurora, Illinois.



## Barber-Greene

### CONSTANT FLOW EQUIPMENT



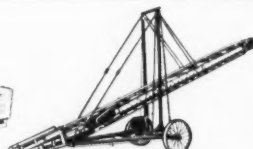
LOADERS



PERMANENT CONVEYORS



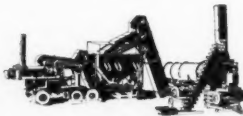
DITCHERS



PORTABLE CONVEYORS



FINISHERS

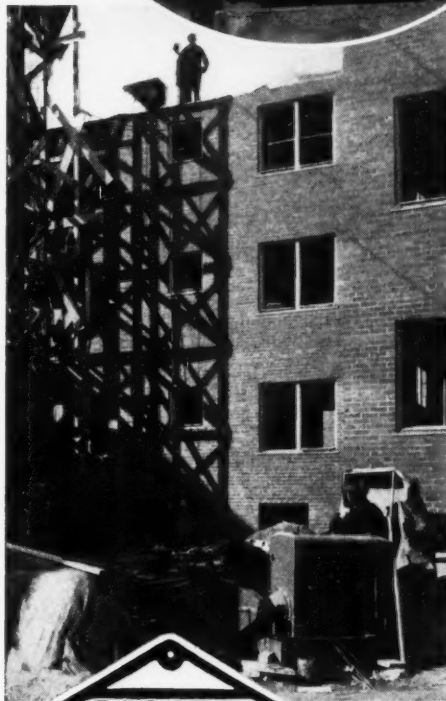
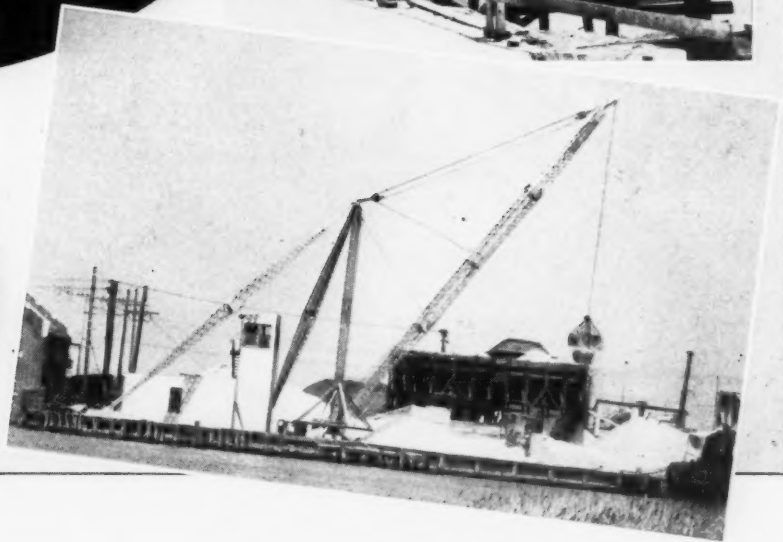


BITUMINOUS PLANTS



COAL MACHINES

**CLYDE HOISTS**  
*for*  
**EVERY JOB!**



Clyde hoists are manufactured in an unusually wide range of sizes and styles to provide the right machine for any kind of construction or material handling work.

Gasoline, Diesel, electric or steam power is available . . . line pulls and speeds that are the most practical and efficient. Every part of every machine is scientifically engineered and accurately machined to give safe, economical and dependable service.

Write today for illustrated bulletins on any type of Clyde quality equipment. Our engineers will gladly make recommendations.

#### THE CLYDE LINE OF DEPENDABLE EQUIPMENT

HOISTS . . . DERRICKS . . . WHIRLEYS . . . CAR PULLERS . . . HAND POWERS  
BUILDERS TOWERS . . . MINE HOISTS . . . PILE DRIVERS . . . DREDGE AND  
DOCK EQUIPMENT . . . DECK MACHINERY . . . LOGGING MACHINERY



**CLYDE IRON WORKS, Inc.**  
Duluth 1, Minnesota



ONLY ONE WAY TO *Correctly* Tension A STUD OR BOLT



## Snap-on TORQOMETERS

**insure accuracy — tell  
tension as bolt  
is tightened...**



WHERE specifications call for accurate, *uniform* stud or bolt tension, Torqometers should *always be used*. "Guesswork" tightening is an open invitation to all the troubles that follow mechanical distortion . . . wasted power, dangerous wear, breakage of parts. Even highly skilled mechanics cannot be expected to approximate specified pressures.

With Snap-on Torqometers any worker can tighten bolts to the exact foot-pound of tension *every time* . . . and on delicate mechanisms, to the *exact inch pound*.

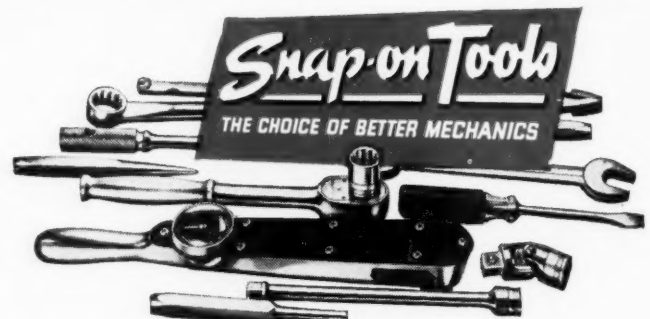
He *sees* the applied torque as the bolt is tightened . . . as easily as reading a watch.

Everywhere in industry Snap-on Torqometers are being adopted as standard wrench equipment for precision assembly and maintenance operations. Available in a complete range of sizes from zero to 30 in. lbs., up to 2,000 ft. lbs. Send for Snap-on catalog of power and hand wrenches for industrial production and maintenance.

**SNAP-ON TOOLS CORPORATION**

8084-F 28th AVENUE

KENOSHA, WISCONSIN





# It's New...

## Not a warmed over wartime model

★ The TL-20 never wore the olive drab of the Armed Forces. Nor is it a prewar baby that languished on the shelf until now. From drafting board to finished product, every effort has been made to make the TL-20 a truly new "postwar" unit in the ½ yd. class.

Check the partial list of TL-20 features shown here. They will give you a good tip-off on both the profit and performance possibilities of this unit. Then, to get the complete story on why the TL-20 carries the label "New"—and can make it stick—ask your Thew-Lorain distributor for a copy of the TL-20 bulletin.

### DESIGN FEATURES:

**Unit Assembly**—Each major component — clutch shaft, engine, hoist shaft, cab, crawler propelling mechanism — can be removed and interchanged as a complete unit.

**5 Identical Clutches**—All operations controlled by 5 shoe clutches, mounted on clutch shaft, which are interchangeable in all working parts.

**Oil-Enclosed Cut Gears**—All gears, on turntable and mountings, are machine cut; all gears (except two) are fully enclosed and run in lubricant.

**One-Piece Turntable Bed**—A husky one-piece, all-welded base designed to absorb strains and shocks, revolving on 4 wide-faced Hook Rollers.

**Anti-Friction Bearings**—Used on all major power shafting and friction clutch drums of turntable.

### UTILITY FEATURES:

**2-Speed Crawler**—2 speeds, standard equipment, available in both directions. Features drop forged treads for greater strength and longer life.

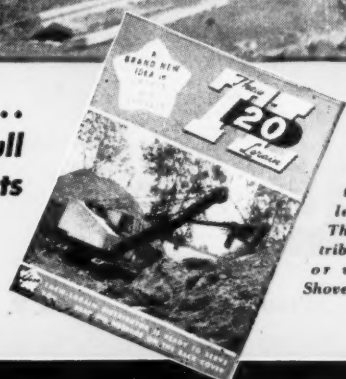
**Rubber-Tire Mountings**—9 rubber-tired mountings (Moto-Crane or Self-Propelled types); 4 or 6 wheel units with or without front wheel drive.

**5 Interchangeable Booms**—Selection of 5 booms for shovel, crane, dragline, clamshell or hoe operation. All are readily interchangeable.

**Independent Shovel Crowd**—Positive cable crowd; all-welded shovel boom and dipper stick; electric dipper trip.



FREE...  
and full  
of facts



The complete, illustrated story on the TL-20 is contained in this bulletin. Ask your Thew-Lorain distributor for a copy or write Thew Shovel Co. direct.

# Thew TL-20 Lorain

THE  
THEW SHOVEL CO.  
LORAIN, OHIO

Available with 5 Interchangeable Booms and Choice of 10 Mountings

# **PRIMED for PERFORMANCE ...ALWAYS** with

## **SINCLAIR Specialized Lubricants**



**M**OTOR VEHICLES — whether they be trucks, buses, power shovels or automobiles—are forever “on call.” They should be ready to go . . . on a moment’s notice . . . with no question about performance under any emergency.

Proper lubrication can go far toward establishing operators’ peace of mind . . . and economical maintenance. Make sure vehicles and machines are primed for performance *at all times* by lubrication throughout with Sinclair automotive oils and greases.

### **SINCLAIR LUBRICANTS for Buses, Trucks, Construction and Quarrying Equipment**

OPALINE MOTOR OIL . . . for engines . . . fortified with additives to resist oxidation, sludge, gum, and bearing corrosion.

OPALINE GEAR LUBRICANT . . . with extreme pressure properties . . . to meet all design load and speed demands.

OPALINE CHASSIS LUBRICANT . . . a tough, sturdy lubricant that protects while it lubricates . . . in spite of rain, snow and mud.

SINCOLUBE . . . made especially for wheel bearing service. Won’t separate, harden, or thin out under varying driving and temperature conditions.

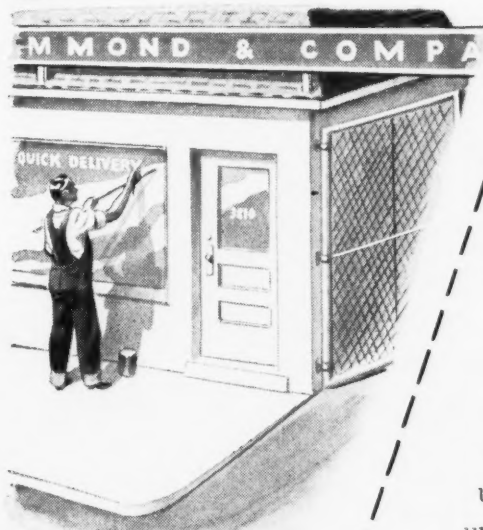
## **SINCLAIR LUBRICANTS-FUELS**

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY, 630 FIFTH AVENUE, NEW YORK 20, N. Y.



## 3 REASONS WHY

Many contractors rely on  
*Job-Rated* dependability



They've found . . . as YOU'LL find . . . that when trucks *fit the job* . . .

- 1 • You get more *dependable* performance
- 2 • You enjoy greater *economy*
- 3 • Your trucks last *longer*!

Dodge *Job-Rated* trucks give you these advantages . . . because they're engineered and built to fit *your* job. Your *Job-Rated* truck will have an engine that's "sized" for *your* loads. It will have the *right* transmission, clutch and every other unit to give YOU better transportation . . . at *lower* cost. Ask owners how well Dodge *Job-Rated* trucks "stood up" through four years of war—and you'll need no further urging to see your Dodge dealer about a truck to fit *your* job!



DODGE DIVISION OF CHRYSLER CORPORATION

**DODGE** *Job-Rated* **TRUCKS**  
FIT THE JOB ... LAST LONGER



# TEN TOUGH MILES BUILT WITH

# ZONED

"Caterpillar" Diesel DW10 Tractor pulling LaPlant-Choate scraper. Of his DW10s, owner R. A. Heintz says: "Easy to handle — no repairs — plenty fast. They operate when other equipment is down."



Rugged power and traction enable "Caterpillar" Diesel D8 Tractors to haul loaded scrapers across the Santiam River after failure of bridges.



Contractor R. A. Heintz, of Portland, believes in "Caterpillar" Diesel Zoned Equipment, and makes it pay.



# EQUIPMENT

**W**hen R. A. Heintz Construction Co. tackled the contract for ten miles of state highway between Albany and Salem, Oregon, last June, it looked like a lengthy and rugged job. Rugged was right. But the contract was finished in November, thanks to the smart handling of "Caterpillar" Diesel equipment, operated on the "Zone" system.

A lot of the short scraper hauls had to be made across the Santiam River. Bridges soon fell under the weight, but the husky "Caterpillar" Diesel D8 Tractors weren't stopped. They forded the stream, pulling loaded scrapers. On the longer hauls, "Caterpillar"

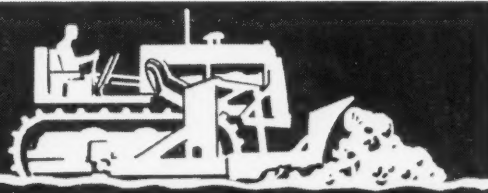
Diesel DW10 Tractors rolled away with the loads on rubber. That's the kind of teamwork that pays off in yards per day.

"Caterpillar" Diesel equipment used on this job included 6 D8s, 1 D7, 2 D6s, 4 DW10s, 1 No. 12 Motor Grader and a D4400 Engine powering the light plant.

**"Caterpillar" builds the units you need to zone your equipment for LOWEST COSTS ON EARTH**

There are "Caterpillar" Diesel Tractors — both track-type and wheel-type — as well as the new matched "Caterpillar" Bulldozers, Scrapers and Wagons to go with them. Also Motor Graders and Engines, sized and powered for a wide range of jobs. The contractor who "goes 100% 'Caterpillar'" has many advantages including service from a single world-wide dealer organization—the most completely equipped in the industry.

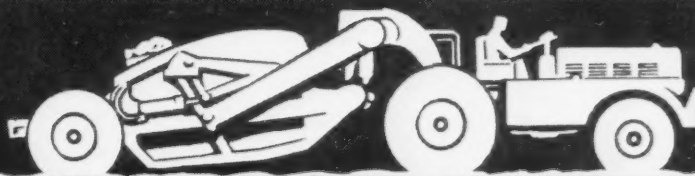
**CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS**



**ZONE 1. "CATERPILLAR" DIESEL TRACK-TYPE TRACTORS EQUIPPED WITH BULLDOZERS AND RIPPERS**



**ZONE 2. "CATERPILLAR" DIESEL TRACK-TYPE TRACTORS FOR LOADING AND PULLING SCRAPERS**



**ZONE 3. "CATERPILLAR" DIESEL WHEEL-TYPE TRACTORS FOR HIGH-SPEED HAULS**

# CATERPILLAR *DIESEL*

REG. U.S. PAT. OFF.

**ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT**





**TAKE  
A LOOK  
INSIDE...**

**for another Transite Sewer Pipe economy**



**O**NE LOOK at the smooth interior surface of Transite Sewer Pipe ( $n=.010$ ) tells you "Here's a pipe with high-flow capacity!" This often permits flatter grades, with lower trenching costs—especially important in rock excavation or wet trenches. Other far-reaching economies:

**Use of smaller pipe**—Instead of using flatter grades, designers sometimes take advantage of Transite's high-flow capacity to use smaller diameter pipe.

**Lower handling costs**—Transite's long 13-foot lengths and light weight mean more pipe per truckload . . . fewer joints to assemble . . . fewer man-hours to lay to line and grade.

**Reduced treatment costs**—Transite joints, combining tightness with flexibility, guard against infiltration . . . reducing load at disposal plant, helping keep treatment costs low.

**Smaller treatment plants**—Possible because Transite minimizes infiltration. Where new plants are being designed, substantial savings in initial cost may be effected.

Further details on Transite Sewer Pipe for gravity lines are given in brochure TR 21-A; on Transite Pressure Pipe for force mains and water lines, in brochure TR 11-A. Write Johns-Manville, Box 290, New York 16, N. Y.



**Johns-Manville TRANSITE SEWER PIPE**

# WHAT'S YOUR JOB?

The Buckeye Line of Cost-Cutting Construction Equipment Will Help You Handle It With Greater Profit!

## Material Spreading?



Buckeye Material Spreaders with spirally fluted feed rolls, spread evenly in measured quantities, from a trickle to a 6" base course. Handle all materials, wet, dry or sticky.

## Trenching?



Buckeye Trenchers—digging wheel or boom types—a model for every trenching requirement—dig through any material short of solid rock. They have made cost cutting records on every major trenching job.

## Dozing?



Buckeye Dozers and Trailbuilders have the "guts" for the big jobs—the balance and control for complete utilization of tractor's power. They dig in and move bigger loads with less effort.

## Road or Airport Construction?

Buckeye R-B Finegraders save time and money in preparing subgrade. One operation provides a smooth, properly crowned, accurate, compact subgrade ready for the paver. Finegraders work faster than paver—keep it going all the time.

## Excavating? Material Handling?



Buckeye Clipper  $\frac{1}{2}$  and  $\frac{3}{4}$  Yard Convertible Power Shovel for efficient, low cost work. Exclusive "Mevac" Metered Vacuum Power Control gives operator "real feel," quicker response.

## Highway Widening?



Buckeye Highway Wideners cut smooth, clean trench of uniform width and depth true to grade, leaving subgrade ready to receive material. Cut trench from 12" to 48" wide and up to 12" deep (24" depth extra), fast and economically.

**BUCKEYE TRACTION DITCHER CO.**  
**FINDLAY, OHIO**

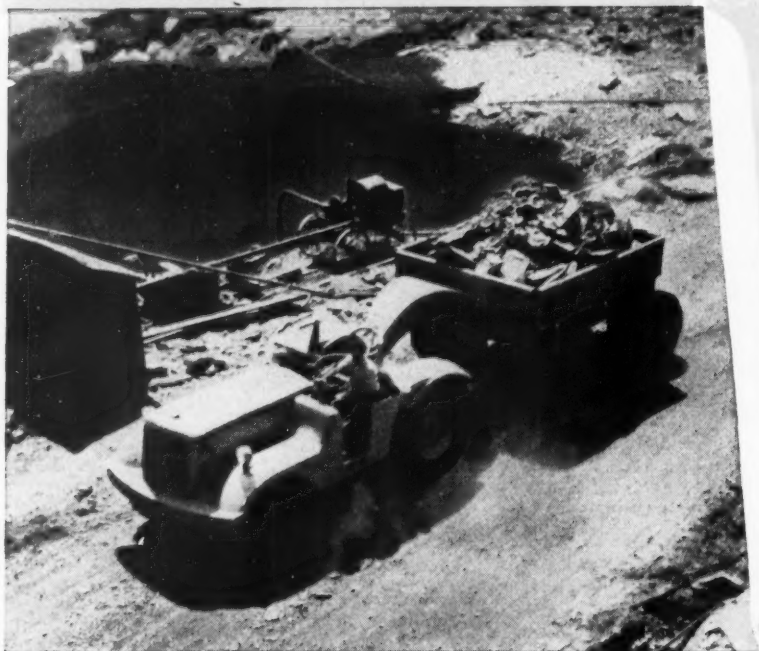
*Built by*

**Buckeye**

CONVERTIBLE SHOVELS—BULLDOZERS—ROAD WIDENERS  
TRENCHERS—MATERIAL SPREADERS—R-B FINEGRADERS



Rubber-Tired for *HIGH-SPEED HAULING*

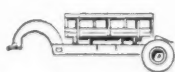


Forged-Trak Wheels for *ADVERSE FOOTING*



**HAULING EQUIPMENT** to meet job needs—that's the Athey story in a nutshell. For long, high-speed hauls, there's the 10 yard, 2-Way Dump Athey PD-10 Rubber-Tired Trailer; built to match the speed and capacity of the DW10 Tractor. For rough going and adverse weather, there's the complete line of rugged Athey Forged-Trak Trailers that keep your toughest jobs going on schedule. It's tracks or rubber with proven Athey products—machines to fit job requirements for lowest costs, biggest profits. Check with your Athey—"Caterpillar" Dealer before you buy *any* hauling equipment—be sure it is custom-selected for your hauling needs. See him today!

**ATHEY PRODUCTS CORPORATION, CHICAGO 38, ILL.**



# All-Job Hauling Units

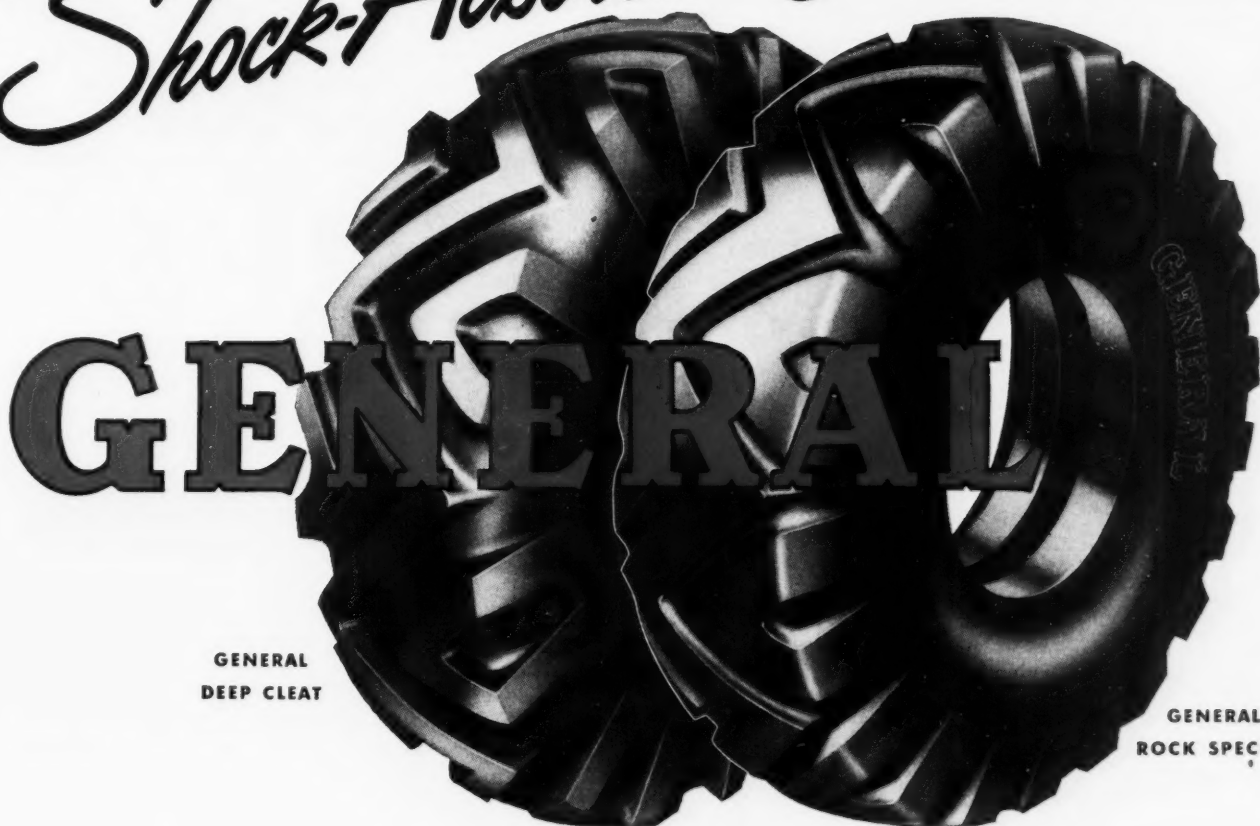


## Athey

**DEPENDABLE LOADING  
& HAULING EQUIPMENT**

# NEW TIRE CONSTRUCTION ABSORBS SERVICE DAMAGE —REDUCES OPERATING COSTS

the *Shock-Absorber Constructed*



● General Off-the-Road Tires take "in stride" the service abuses that commonly cause tire failures. Their exclusive construction *absorbs* and uniformly distributes heaviest shock loads and stresses throughout the tire carcass . . . thereby neutralizing concentrations of impact that

frequently cause bruising . . . tearing . . . snagging . . . blow-outs.

Built with General's famous Top Quality, the exclusive shock-absorbing design of General Off-the-Road Tires produces a new standard of long tire service and economy for heavy contractors.

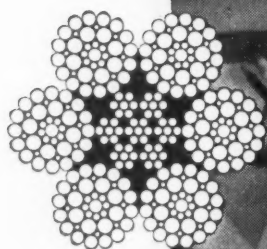
**THE GENERAL TIRE & RUBBER CO. • AKRON, OHIO**



## OFF-THE-ROAD TIRES



# Wire rope "architect" at work ... for YOU!

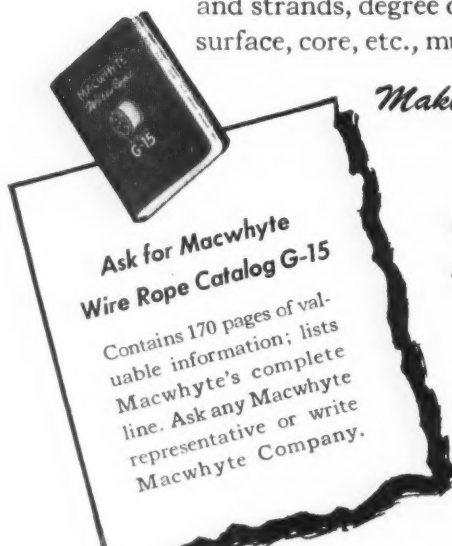


To give the finished product maximum service, safety and economy, Macwhyte Wire Rope is carefully blueprinted by "architects" before any actual manufacturing starts. These men are Macwhyte's highly skilled design engineers.

Such things as size and quality of wires and strands, degree of flexibility, bearing surface, core, etc., must be accurately de-

termined. The engineer's calculations must be perfect to produce a rope in which all parts fit uniformly and work together as a team to best meet operating conditions.

Proper designing is just one example of the thoroughness Macwhyte exercises at every step in planning and producing wire rope. No effort is spared to make it the *correct* rope for your equipment.



*Make Macwhyte your headquarters for Wire Rope and Slings*

## MACWHYTE WIRE ROPE

MACWHYTE COMPANY, 2941 Fourteenth Ave., Kenosha, Wisconsin

Mill Depots: New York • Pittsburgh • Chicago • Minneapolis • Fort Worth • Portland • Seattle  
San Francisco • Los Angeles • Distributors throughout the U. S. A. and other countries

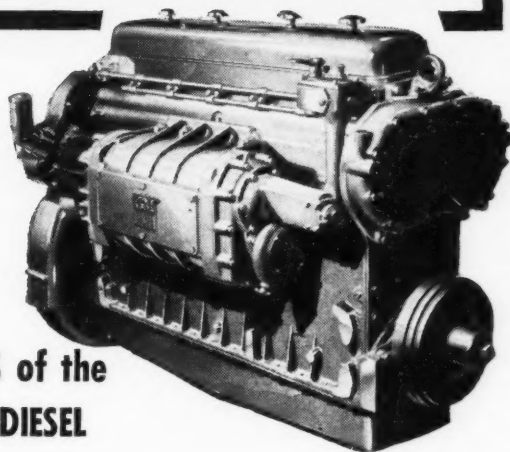
★ ★ ★ ★

MACWHYTE PREformed and Non-PREformed Wire Ropes  
— Internally Lubricated . . . MONARCH WHYTE STRAND  
Wire Rope . . . Special Traction Elevator Rope . . . Braided Wire  
Rope Slings . . . Aircraft Cables, Assemblies and Tie-Rods . . . Stainless  
Steel Wire Rope, Monel Metal Wire Rope,  
Galvanized Wire Rope.





# DIESEL POWER



## FEATURES of the GM "71" DIESEL

- Compactness
- Quick starting under all conditions
- 2-cycle, smoother operation
- Easy accessibility of wearing parts
- Unit injectors—no high-pressure piping
- Maximum parts interchangeability regardless of number of cylinders
- Uniflow performance at high altitudes

## WHAT'S IN A NAME PLATE?

IN THIS CASE the name plate holds the secret of the satisfaction you will have with Diesel power.

For this name plate is evidence of some of the most intensive work ever undertaken in the General Motors Research Laboratories.

It started back when all Diesels were cumbersome, stationary engines. But the Diesel idea looked good. Maybe it could be made more useful. So GM experts went to work on it.

THEY MADE IT two-cycle—quick to respond to additional loads because power is furnished on every downward stroke of each piston. They eliminated all the old surplus weight and size of former Diesel engine practice and built in a more than ample supply of horsepower. They developed unit injection—did away with high-pressure fuel tubing. They designed Uniflow scavenging—made a clean-burning, efficient engine. Then to top it all, they simplified the design and made wearing parts easy to get at, and interchangeable even between engines with different numbers of cylinders.

ALL THIS has added up to today's sturdy, hard-working, money-saving GM Diesel—a Diesel that brought the era of the GM locomotive and its streamliners, a Diesel that has changed the picture of marine propulsion—an industrial Diesel ready to take on the toughest jobs of transportation, construction, fishing, mining, lumbering and anything else you have to offer. Yes, ready to take them on and do them more reliably, at lower cost.

*A nation-wide organization of GM Diesel sales and servicing dealers stands ready to handle every need for parts and service.*

## DETROIT DIESEL ENGINE DIVISION

DETROIT 23, MICH. •

SINGLE ENGINES . . . Up to 200 H.P.  
MULTIPLE UNITS . . . Up to 800 H.P.

G E N E R A L M O T O R S

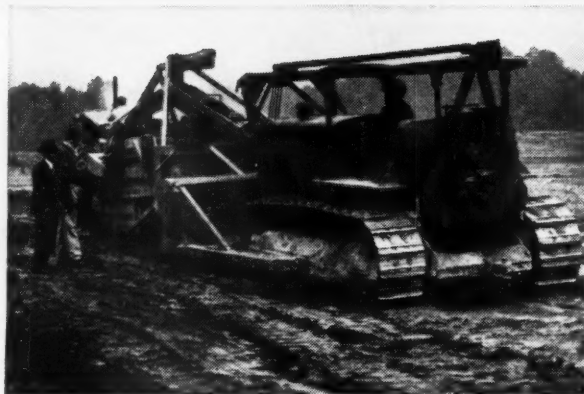


# Gulf Products keep equipment rolling—

*—prevent mechanical delays on  
rush grading job!*



MacDougald Construction Company and W. C. Shepherd, both of Atlanta, Georgia, combined equipment and personnel to move over 600,000 yards of earth in 40 days in preparation for the construction of a new General Motors assembly plant at Doraville, Georgia. Like many other leading contractors, they selected Gulf quality lubricants and fuels to help prevent delays and insure top performance from every unit of equipment.



THE contract for this grading job called for moving over 15,000 yards per day — and keeping "on schedule" meant no unnecessary time out for equipment. Every unit had to stay right on the job and operate at top efficiency.

That's why Gulf quality lubricants and fuels were selected by the contractors, MacDougald Construction Company and W. C. Shepherd\*. They know from experience that Gulf products insure smooth, dependable performance of equipment and help prevent mechanical delays.

Gulf quality lubricants and fuels are good profit insurance! Call in a Gulf Service Engi-

neer before you start your next job—let him show you how Gulf products improve job efficiency and reduce maintenance costs. Write or wire your nearest Gulf office today.

**Gulf Oil Corporation • Gulf Refining Company**

*Division Sales Offices:*

Boston • New York • Philadelphia • Pittsburgh • Atlanta  
New Orleans • Houston • Louisville • Toledo



**for extra profits**



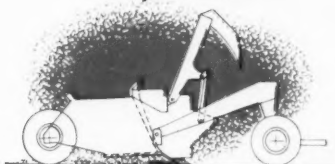
*Choose Carrimors\**



**Easier Loading**



**Lower Horsepower Requirements**



**Faster,  
Cleaner Dumping**

**The scrapers that give you all the good points of other rigs — AND A LOT MORE BESIDES!**

Whenever you find a scraper that consistently *outperforms* competitive models on job after job, it must have "something on the ball." And that certainly is the case with the new 8 and 14-yard LaPlant-Choate "Carrimors." On hundreds of tough earthmoving jobs from coast to coast these improved outfits are definitely getting bigger pay loads with less power . . . getting rid of them faster at the dump . . . and saving hours of costly "down-time" for maintenance and repairs.

Designed and built by earthmoving men with more than 33 years of specialized "know-how", LPC "Carrimors" are *yards* ahead in performance because they are *years* ahead in practical engineering features. But don't take our word for it. Ask to see them *in action*. Then you'll see why so many agree on LPC—for lowest possible cost per yard—wherever scrapers are used behind crawler tractors. LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa; Oakland, California.

\*Reg. U.S. Pat. Off.

**LaPLANT - CHOATE**

*Job-Proved Equipment...*

**for lowest possible cost  
in Moving Earth**





# **LARGEST** *All Welded* *High Pressure Gas Holders*

SOUTHWEST WELDING & MANUFACTURING COMPANY field erected four High Pressure GAS HOLDERS, 34' in diameter x 205' overall in length, totaling 2,000,000 cubic foot capacity, under sub-contract to Bethlehem Steel Company, for the City of Long Beach, California.

These huge GAS HOLDERS were completely fabricated from A-212 Grade B Fire-box Plate, and constructed to withstand an operating pressure of 55 pounds PSI. To insure quality in field-welding, all seams were Magnafluxed, and upon completion, GAS HOLDERS were subjected to a 60.5 pound PSI air test. Approximately 1,500 tons of steel were required in the erection of the four GAS HOLDERS.

SOUTHWEST'S efficient engineering personnel, supervision and field crews are your assurance of receiving good workmanship on any type of steel construction, including pressure holders, penstocks, siphons, caissons, field storage tanks of any size, capacity or location.

**Consult us on your future requirements**



## **Southwest Welding & Manufacturing Co.** *Alhambra, California*

# First Across the Rhine..

## Buda Diesels with Diamond Fuel Pump Drives

*Photo Courtesy U. S. Signal Corps*

Included in the equipment made by Buda are the Diamond equipped Diesel engines on the Whitcomb locomotives that were first across the Rhine—that pulled the first train into liberated Paris, and the first supply and hospital trains into Belgium.

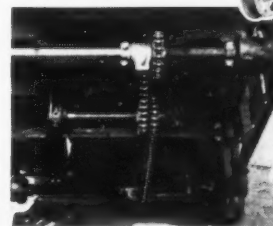
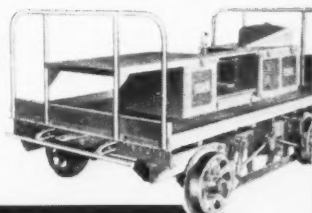
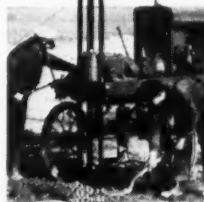
On these widely used Diesel engines and the many other kinds of Buda equipment, Diamond Roller Chains are used regularly for various drives.

Like other leading builders of machinery and equipment, Buda recognizes the importance of the long-life efficiency, uniform accuracy and dependability that Diamond Drives provide.

In fractional horsepower capacities or several thousand,—for slow, high, or very high speeds, Diamond Drives are available and adaptable to your needs. . . . Engineering recommendations are yours for the asking . . . . DIAMOND CHAIN COMPANY, Inc., Dept. 418, 402 Kentucky Avenue, Indianapolis 7, Indiana. Offices and Distributors in All Principal Cities.

The popular Buda Diesel as used on the Whitcomb locomotive has Diamond Roller Chain Pump Drive.

Buda Earth Drill, equipped with Diamond Roller Chains, preboring for piles through 22 feet of tough soil for overpass supports.

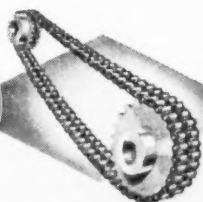


The Mu gauge B railway specimen has two Diamond Roller Chain Drives—simple, accessible, easily serviced.

Chore Boy, another Buda product, employs Diamond Drive from gas engine and to rear wheel shaft.



# DIAMOND



# ROLLER CHAINS



# RODGERS "Sixty" SHOP PRESS

A new **60**  
Ton Press...  
for **60** time-  
saving uses

## MOVEABLE CYLINDER

Cylinder is adjustable completely across top bolster—mounted on four rollers that ride on the bolster channel. Ram travel  $2\frac{1}{2}$ " per stroke of pump. Cylinder detaches from press and with added hose may be used as a jack, clamp or press in any position.

## WIDE WIDTH — 45"

Working space on bolsters (45") permits the entrance of large gears, wheels or pulleys. 10" opening between front and back bolster.

## ADJUSTABLE 8" to 38"

Working daylight between top and lower bolster adjustable from 8" minimum to 38" maximum. Bolster is raised and lowered by a hand crank.

## END OPENING — 8"

Long work may be slid through either end of the press without encountering any obstructions. The opening between the columns is a full 8".

## HANDY VALVE & GAUGE

The hydraulic gauge marked in pounds and tons and the quick opening valve are located at the right side of the press, above the hydraulic pump, for convenience of the operator.

## 2-SPEED PUMP

2-Speed pump, sturdy and simple, self lubricating, needs no attention. Ram moves  $2\frac{1}{2}$ " each stroke of pump when pump is set for high speed—giving up to 2,000 lbs. pressure in rapid travel. Flip of lever changes pump to high pressure.

## FLOOR SPACE ONLY 38"x70"

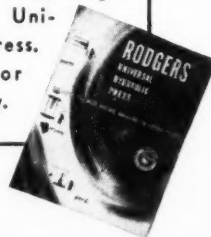
The "Sixty" requires small amount of floor space, only 38" x 70". Performs many operations such as: pressing, straightening, bending, shearing, clamping, broaching, riveting and assembly work.

**T**HE Rodgers Model "Sixty" 60 ton Shop Press is ideal for machine shops, tool rooms, garages, tractor or farm service stations, highway repair shops and repair plants or many industrial projects — you will find that one or more in your shop is a good investment that will pay dividends quickly. It is also available in a special size with a daylight opening from 8" to 48".

Write or wire today for complete details.

## OTHER RODGERS PRESSES

... are described in this catalog. Included are the Rodgers 100 ton and 150 ton Shop Presses, and the Rodgers Portable Universal Press. Write for your copy.



Shop Presses

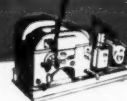


Crawler-Track Presses

# Rodgers Hydraulic, Inc.

HYDRAULIC POWER EQUIPMENT

7403 Walker St., St. Louis Park, Minneapolis 16, Minn.



Power Pump Units



Portable Presses



# *Let him tell you*

Steve's a drill jockey. Earns his paycheck cutting holes in rock. Like everyone else, he likes the tools that make his work go faster and easier.

Steve doesn't talk much. But once in a while he'll open up.

"For speed," he'll tell you, "one of the things I need is a good, tough drill steel. One that isn't afraid of rock. The steel I'm gettin' now can lick this rock any day. I'm makin' plenty of footage."

Sure, Steve. That's Bethlehem Hollow you're using.

The blacksmith, too, can give you some facts about Bethlehem Hollow Drill Steel. He knows that it makes up readily; is always true to size; has a round, smooth, well-centered hole. He also knows that its wide quenching range makes heat-treating easier.

Bethlehem Hollow is equally suitable for both threaded rods and forged-on bits. Whenever there's drilling to be done, insist on this "old reliable."



★ BETHLEHEM HOLLOW DRILL STEEL





SERVING THE CONSTRUCTION INDUSTRY SINCE 1872



75  
YEARS  
*in the Making!*

The OSGOOD Type 100 is available as shovel, clamshell, dragline, crane and stripper. Write for your copy of the new Type 100 Bulletin.

## THIS IS THE NEW OSGOOD TYPE 100

. . . modern from crawlers to point sheaves . . . a powerful new machine incorporating design and construction advancements never before available. Yet the OSGOOD Type 100 has been "on the boards" for 75 years!

For three quarters of a century, OSGOOD has designed and built equipment for the construction industry, pioneering improvements that have long since become standard. Today, the experience and know-how gained through 75 years of manufacturing dependable, economical-to-operate machines is

reflected in this newest OSGOOD unit. Here is ample power for the toughest job, ease of operation that means more work per day, economy of operation that means more profit per job. Watch for the OSGOOD Type 100 . . . plan now to enjoy the advantages that only an OSGOOD can provide.

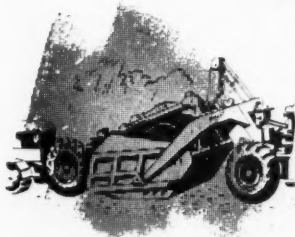


<p>THE <b>GENERAL</b> EXCAVATOR COMPANY <b>CRANES, DRAGLINES AND SHOVELS</b> DIESEL, GAS, ELECTRIC</p>	<p>Associated with The General Excavator Company</p> <p><b>OSGOOD</b></p> <p>THE OSGOOD COMPANY • MARION, OHIO</p>	<p><b>OSGOOD</b> <b>SHOVELS, DRAGLINES CRANES</b> CRAWLER &amp; WHEEL MOUNTS DIESEL, OIL, GAS, ELECTRIC</p>
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#### HENRY FRENCH

University of Wisconsin graduate • Independent contractor • Chief engineer and later works manager of Heil-Milwaukee plant • Chief engineer in charge of tool design for all Heil war equipment production • Now in charge of development engineering program at The Heil Co.



#### G. S. STORATZ

Master's degree in metallurgy • B.S. degree in engineering • Entry on high-speed dirt movers won first prize in the James F. Lincoln welding competition for 1940-1942 • Author of many articles on welding • Engineer in charge of Road Machinery at The Heil Co.



## Meet the engineers



#### CHAUNCEY HART

Head of field and experimental welding department of large manufacturer of heavy construction equipment • Came to Heil in 1940 • Selected by U.S. Ordnance Division for development and experimental work on armor plate for ballistics • Developed many new procedures and special techniques • Developed production welding of aluminum plate • Now chief welding engineer for The Heil Co.



*whose original ideas and practical ingenuity have given you new advances in speed and performance — with Heil Road Machinery*

Unrelenting search for new and better methods . . . new processes . . . new fabricating techniques . . . characterizes the development program that has established Heil Road Machinery as a leader in dirt-moving progress.

Behind Heil machines stands Heil manpower — including engineers whose special talents have brought many innovations in designing, fabricating, and testing. They are a step ahead with the new . . . the more practical ideas that result in more speed, more efficient performance, and more profit for you. Look to Heil for continued leadership.

## THE HEIL CO.

GENERAL OFFICES

MILWAUKEE 1, WISCONSIN

R-70



SERVING THE CONSTRUCTION INDUSTRY SINCE 1872



75  
YEARS  
*in the Making!*

The OSGOOD Type 100 is available as shovel, clamshell, dragline, crane and stripper. Write for your copy of the new Type 100 Bulletin.

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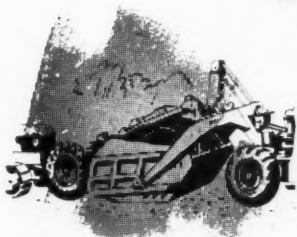


<p>THE <b>GENERAL</b> EXCAVATOR COMPANY <b>CRANES, DRAGLINES AND SHOVELS</b> DIESEL, GAS, ELECTRIC</p>	<p>Associated with The General Excavator Company</p> <p><b>OSGOOD</b></p> <p>THE OSGOOD COMPANY • MARION, OHIO</p>	<p><b>OSGOOD</b> <b>SHOVELS, DRAGLINES CRANES</b> CRAWLER &amp; WHEEL MOUNTS DIESEL, OIL, GAS, ELECTRIC</p>
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#### CHAUNCEY HART

Head of field and experimental welding department of large manufacturer of heavy construction equipment • Came to Heil in 1940 • Selected by U.S. Ordnance Division for development and experimental work on armor plate for ballistics • Developed many new procedures and special techniques • Developed production welding of aluminum plate • Now chief welding engineer for The Heil Co.



*whose original ideas and practical ingenuity have given you new advances in speed and performance — with Heil Road Machinery*

Unrelenting search for new and better methods . . . new processes . . . new fabricating techniques . . . characterizes the development program that has established Heil Road Machinery as a leader in dirt-moving progress.

Behind Heil machines stands Heil manpower — including engineers whose special talents have brought many innovations in designing, fabricating, and testing. They are a step ahead with the new . . . the more practical ideas that result in more speed, more efficient performance, and more profit for you. Look to Heil for continued leadership.

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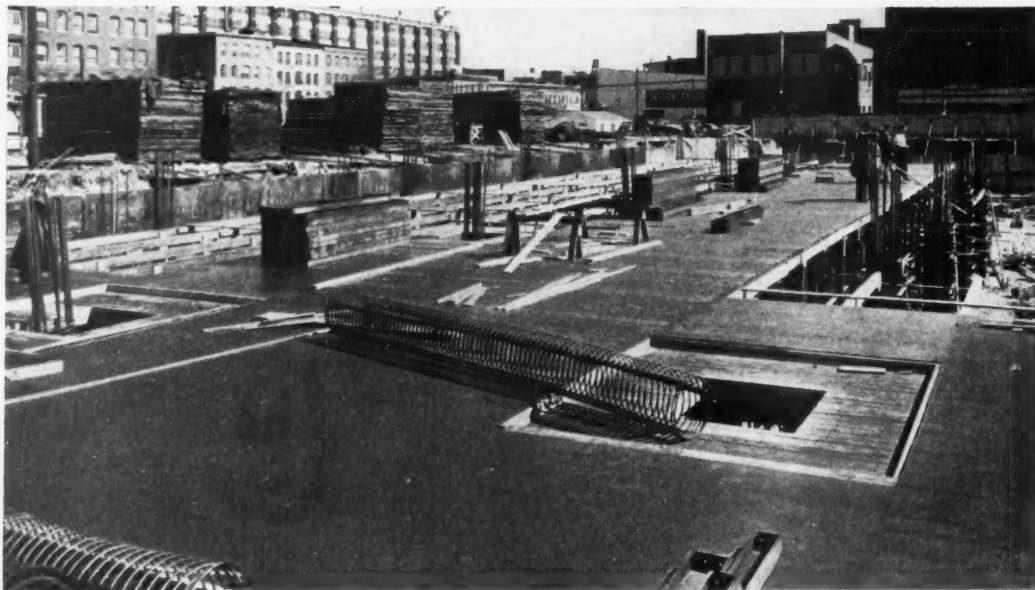
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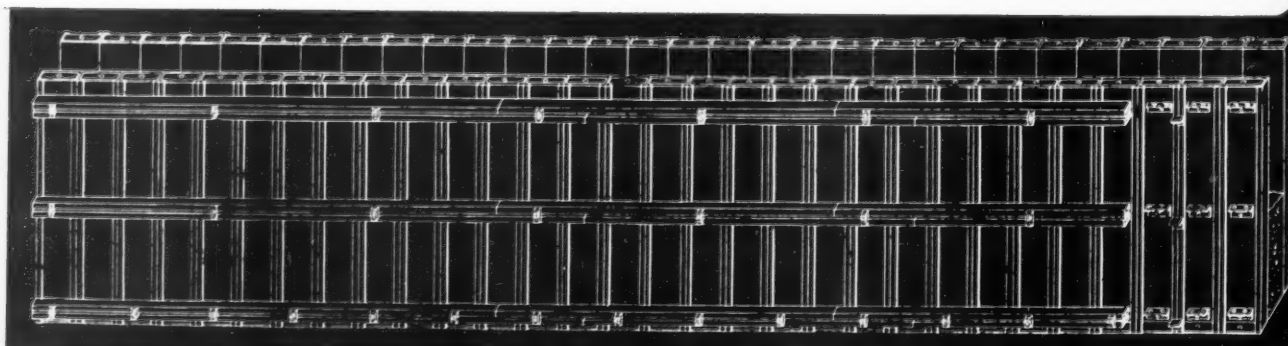
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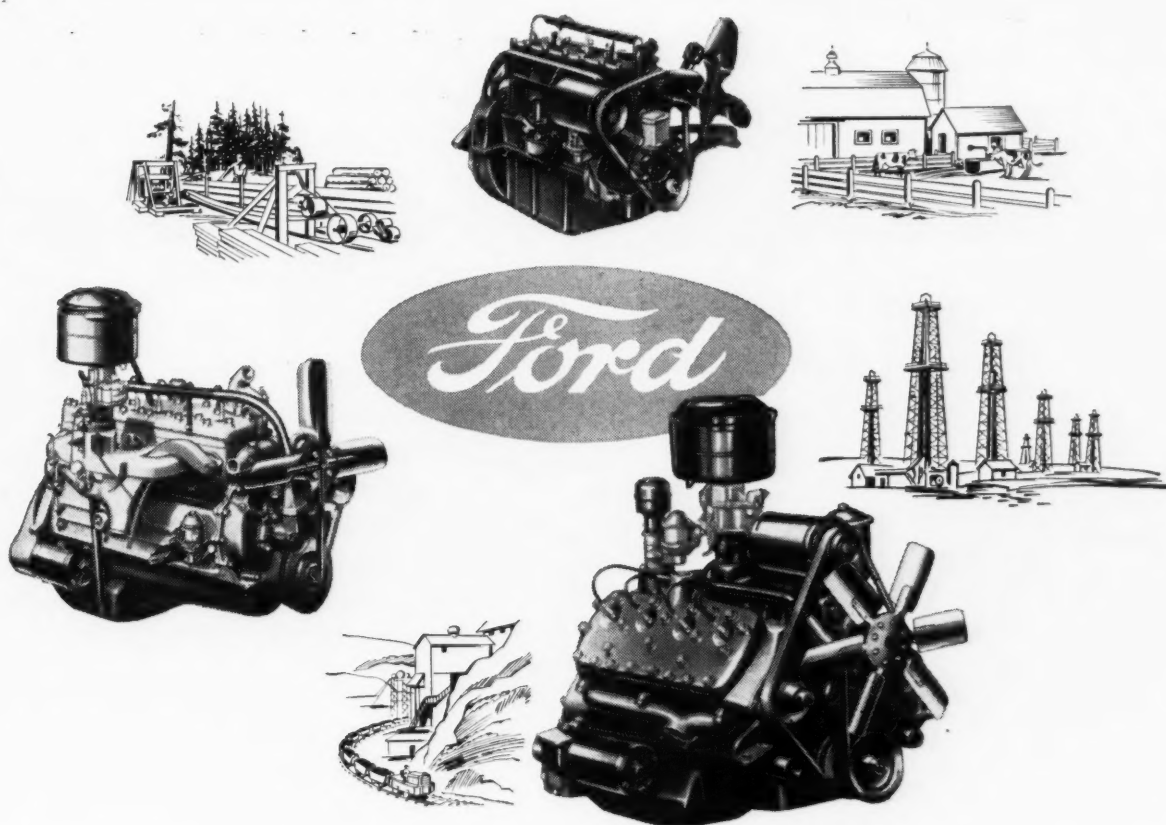
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Three time-proved Ford-built engines are now available to manufacturers and individual purchasers—the 40-H.P. Four, the 90-H.P. Six and the 100-H.P. V-8. Each offers sure, enduring power applicable to a wide range of uses. For detailed specifications and dimensional data, write—

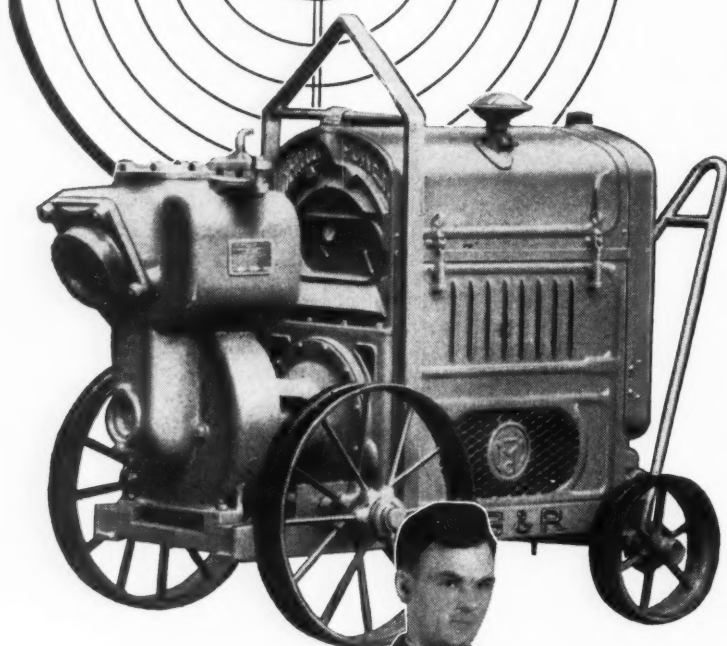
**FORD MOTOR COMPANY**  
Industrial and Marine Division, Dept. 60  
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Gorman-Rupp self-priming centrifugal pumps never have to be shut down to be cleaned out -- there is no recirculation orifice to get plugged nor control valve to get jammed.

They are streamlined inside where streamlining counts.

Ask what you want of a Gorman-Rupp pump. Give it any kind of a test. Actual performance on the job will convince you.

*For details call your nearest distributor.*

**THE**



**GORMAN-RUPP COMPANY**

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Mansfield, Ohio

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"Dri-Tite" Tarpaulins are available in all standard sizes in various weights. They're real protection against rain, snow and sleet because of the Bemis "Dri-Tite" waterproofing process. They're excellent protection against sun, too. "Dri-Tite" Tarpaulins never suffer from "running" or softening in warm weather, never stiffen or crack in cold weather.

Write Bemis today for your 1946 schedule of prices.

Note These Construction Features of Bemis "Dri-Tite" Tarpaulins —

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"Dri-Tite"  
Tarpaulins**

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# YOU GET ALL THESE *Profit-Earning Features*

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## FULLY CONVERTIBLE **MICHIGAN** MOBILE SHOVEL-CRANES

$\frac{3}{8}$  and  $\frac{1}{2}$  YD. SHOVELS  
6 to 12 TON CRANES

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CM-66

**TRUCK MOBILITY** that cuts travel-time, reduces travel-expense between locations. MICHIGAN travels under its own power at 30 MPH speed wherever an ordinary truck can go.

**SPEED** that gets every job done sooner, permits more work to be profitably handled with one machine.

**OPERATING EASE** that every operator likes and wants. MICHIGAN Fingertip Air Controls minimize fatigue, help maintain high production on every job.

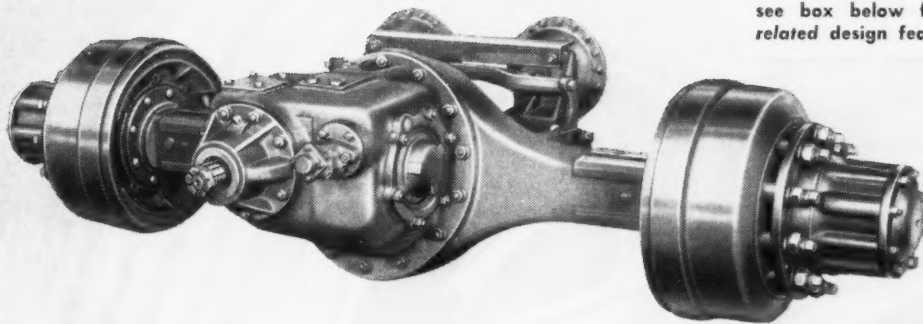
**ECONOMY** that reduces operating overhead, increases profit-margins on all kinds of shovel-crane work.

**LONG LIFE** that makes MICHIGAN a better-paying investment and results from first-class design, materials and workmanship.



# **MICHIGAN**

**POWER SHOVEL COMPANY**  
BENTON HARBOR MICHIGAN



Timken Two-Speed Double-Reduction Axles are the most modern two-speeds in production today. S and U Heavy-Duty Series illustrated at left—see box below for partial list of advanced-related design features.

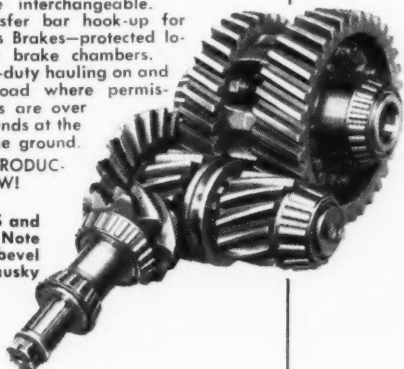
# ROLL 'EM!

## ...FAR AND FAST...IN EITHER SPEED!

### NEW TIMKEN S and U 300 Series Two-Speed Double-Reduction Axles offer EVERY MODERN FEATURE!

- Combines for the first time advantages of hypoid-bevel gearing with those of helical spur gearing.
- New Timken Easy Power Shift permits effortless change of axle ratios as required for speed, load or road conditions. Change from one ratio to the other accomplished without loss of vehicle speed by selector and accelerator action only. No clutch action required.
- Built-in shift mechanism—lubricated by gear lubricant.
- Single-speed final drive of S and U 200 and two-speed final drive of S and U 300 are interchangeable in same axle housing using same axle shafts.
- New housing design gives uniform distribution of load stresses with minimum weight.
- New differential with 9-16 tooth combination.
- New shaft design eliminates failures at splines.
- Sixteen slant-sided axle shaft splines with increased root diameter permits maximum shaft diameter.
- New "DP" Heavy-Duty Hydraulic Brake (only true heavy-duty hydraulic made today) and famous "P" Series Power Brake are interchangeable.
- New transfer bar hook-up for "P" Series Brakes—protected location for brake chambers.
- For heavy-duty hauling on and off the road where permissible loads are over 18,000 pounds at the tires on the ground.
- IN FULL PRODUCTION NOW!

Gear train of S and U 300 Series. Note new hypoid-bevel gears—big, husky helical gears. Timken tapered roller bearings are adjustable.



### THEY'RE TRUE TWO-SPEED AXLES

You don't have to baby Timken Two-Speed Double-Reduction Axles.

If you want to haul something somewhere in *low speed*, you go ahead and haul it—as far as you want, as fast as you want. You can highball in low range all the way across Texas if you need to, without your Timken Two-Speed working up even a boy-size sweat.

And the same thing goes for the high range.

With a Timken, *you* call the tune. *You* say which gear ratio you want to use and how long you want to use it, instead of the axle telling you.

Remember this the next time you need a two-speed axle and want a **TRUE** two-speed.

But there's more to the story than this. For example, Timken two-speed gear ratios were *selected* to meet present-day conditions and demands, instead of the fundamental design of the axle dictating what ratios could be offered. Therefore, as conditions and demands change in the future, Timken ratios can change with them — *and will!*

Another thing is that Timken Two-Speed Double-Reduction Axles provide up to two inches more ground clearance. So, if you operate "two-speed" off the pavement, here's still another reason to specify Timken.

There are scores of other Timken two-speed features. Write for a copy of our new folder—or ask your Timken Field Man the next time he calls. You'll find it worth your while.



# TIMKEN AXLES

THE TIMKEN-DETROIT AXLE CO. • DETROIT 32, MICH.  
WISCONSIN AXLE DIVISION • OSHKOSH, WIS.  
TIMKEN AXLE BRAKE DIVISION • DETROIT 32, MICH.

**AMERICA PROGRESSES  
THROUGH CONSTRUCTION**



# Building Hospitals

## BUILDS WEALTH THROUGH HEALTH

THIS country needs from 1500 to 2000 new civilian hospitals and 2700 health centers, the U. S. Public Health Service reports. This need is emphasized because approximately 1200 counties, with a population of about 15,000,000 have no hospitals within their boundaries. The cost of supplying these National health needs would amount to more than \$2,000,000,000.

In addition, the Veterans' Administration program calls for the construction of 77 new hospitals. The cost of these

hospitals, together with additions and improvements to the 106 existing veterans' institutions, will be \$448,000,000.

These civilian and veteran hospital facilities deserve the best in planning and execution. A. G. C. contractors have the skill, integrity and responsibility to construct these health projects of highest quality with maximum efficiency and economy. They are pledged to sound business principles exemplified by the A.G.C. emblem.



*This advertisement is No. 6 of this series*

## THE ASSOCIATED GENERAL CONTRACTORS of AMERICA, Inc.

*More Than Ninety Branches and Chapters Throughout America*  
National Headquarters — Munsey Building, Washington 4, D. C.

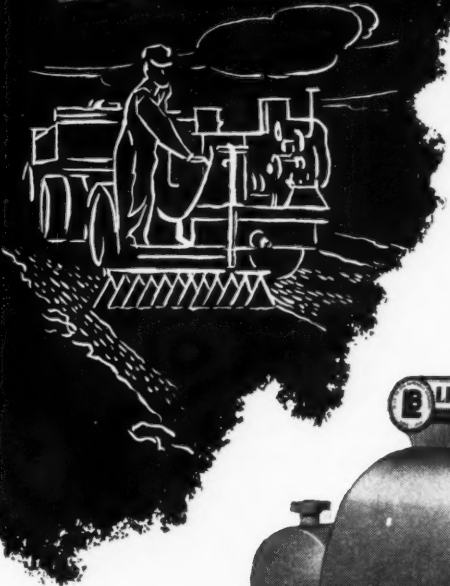
**SKILL, INTEGRITY AND RESPONSIBILITY IN CONSTRUCTION OF BUILDINGS, HIGHWAYS, RAILROADS, AIRPORTS AND PUBLIC WORKS**



# THIS No. 101 UNIT IS PACKED FULL OF UTILITY



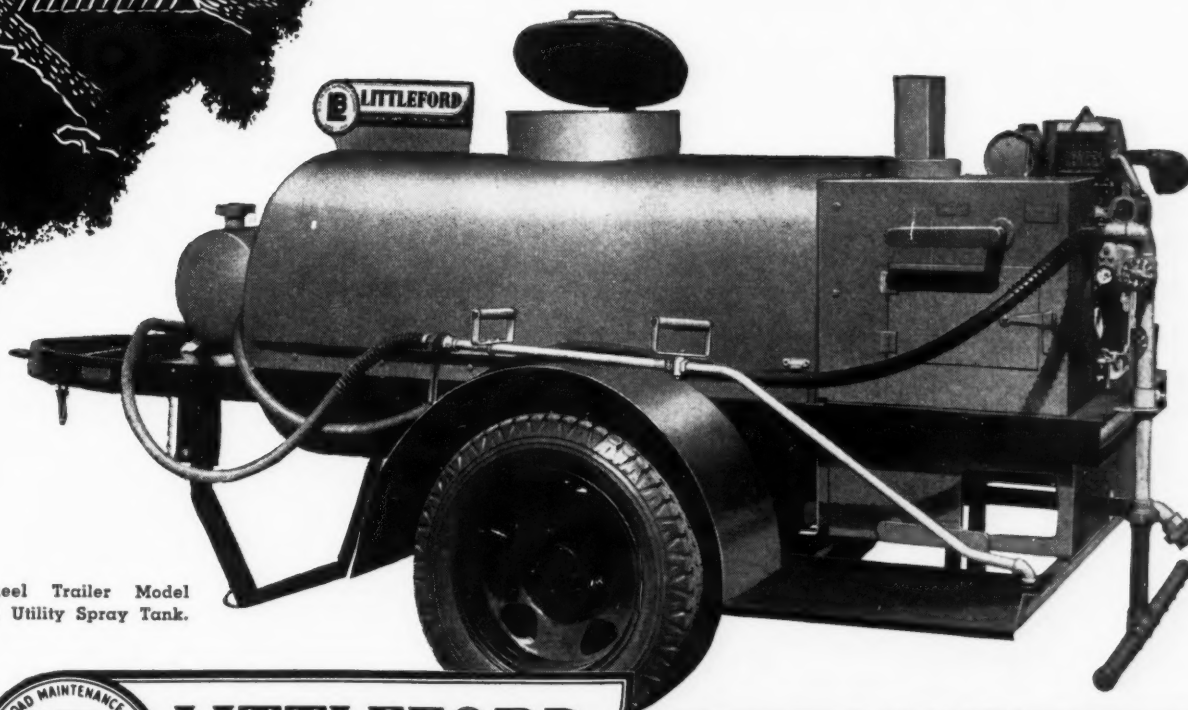
Truck mounted No. 101 using Hand Spray Attachment.



When those Streets, Roads or Airport Runways need repair, the Littleford Model No. 101 Utility Spray Tank is just the unit for the job. It's a combination of three units in one—has Spray Bar for small application work, Hand Spray for patch work and a Pouring Pot Outlet for crack filling work.

No. 101 will handle Asphalt, Tar, Cut-back, Road Oils and Emulsions. For real Utility be sure to use a Littleford No. 101 Utility Spray Tank.

Two-wheel Trailer Model No. 101 Utility Spray Tank.



## LITTLEFORD

## LITTLEFORD BROS., Inc.

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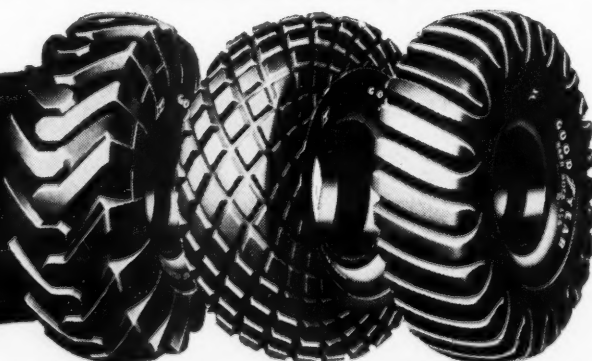
**LOW-COST  
HIGH-HOUR  
PERFORMANCE**

**is the reason why year after year  
MORE YARDS ARE MOVED ON**

**GOODYEAR**

**OFF-THE-ROAD TIRES  
THAN ON ANY OTHER KIND!**

**BUY and SPECIFY  
GOODYEAR  
— it pays!**



**SURE-GRIP EARTH  
MOVER** for maximum  
traction on drive wheels

**ALL-WEATHER EARTH  
MOVER** for drawn  
vehicles and general  
traction

**HARD ROCK LUG**  
for all rock work

Sure-Grip, All-Weather—T.M.'s The Goodyear T. & R. Co.



# Construction Methods

WALDO G. BOWMAN, Editor

Volume No. 28

JUNE, 1946

Number 6

## PIPE BENDER

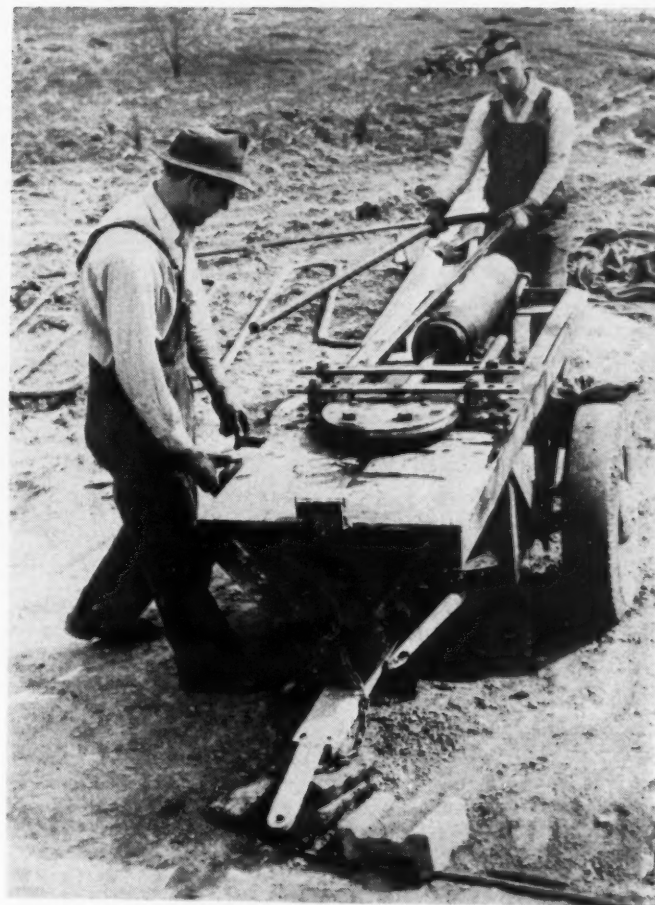
### Forms Radiant-Heating Coils

TO INSURE WARM, DRY FLOORS, wrought-iron radiant-heating coils were installed in the concrete floor slabs of 33 basementless houses built near Pittsburgh, Pa. in one of the first post-war housing developments to feature this type heating. In addition to solving the cold floor problem, the radiant-heating system, supplied with hot water from a gas-fired boiler, permitted utilization of all floor space by eliminating exposed radiators.

Sinuous heating coils of 1¼-in. Byers wrought-iron pipe, bent 180 deg. and welded at the site, were laid on a 6-in. gravel blanket, tested under 250-lb. pressure, and covered with a 5-in. reinforced concrete floor slab. The contractor, Frank Corace, developed a pipe-bending machine from the hydraulic cylinder of a dump truck, which rapidly cold-bent all coils. The cylinder, mounted on a small, two-wheel trailer, was actuated by an electric pump slung below the trailer bed.

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**FLOOR SLAB** (below), of 5-in. reinforced concrete, is poured over radiant-heating coils laid on 6-in. gravel blanket. Pipe runs are normally on 12-in. centers and will give warm, dry floors for basementless houses.



**BENDING MACHINE** rapidly cold-bends 1¼-in. wrought-iron for radiant-heating coils in 33 small houses. Pressure for cylinder from old hydraulic dump truck is supplied by electric pump mounted beneath trailer bed.

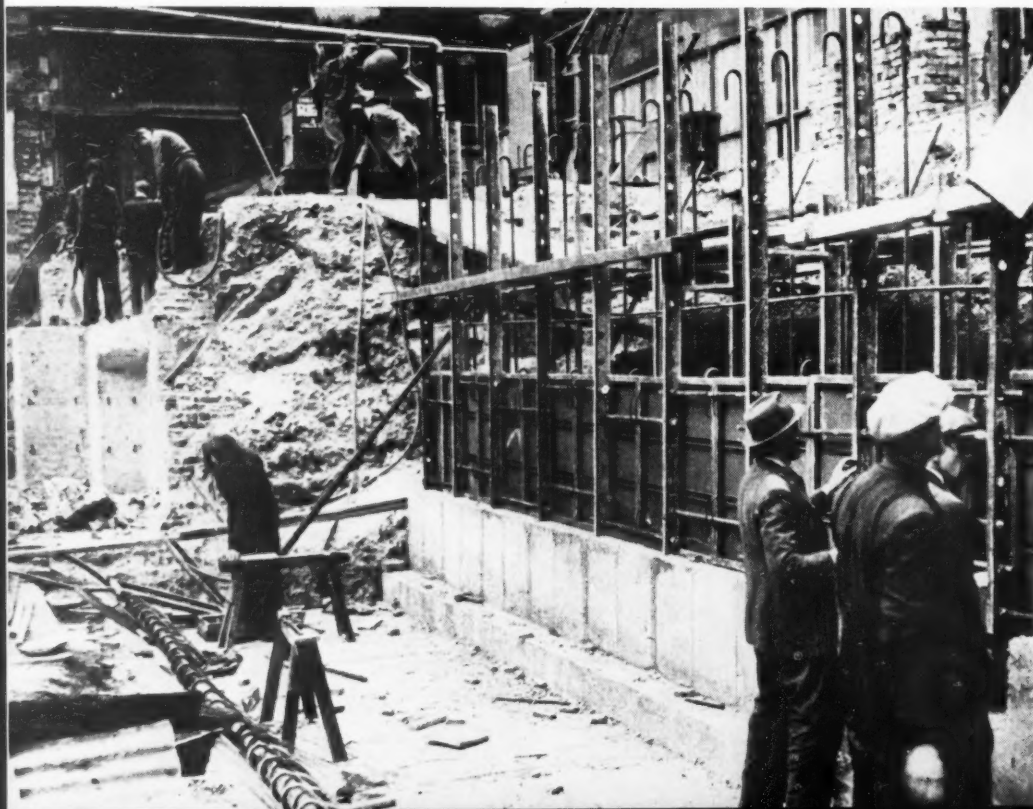






**CONSTRUCTION OF DAVIS DAM.** \$77,000,000 Bureau of Reclamation project, gets under way as 24,000 lb. of TNT blasts top from Nevada mountain. Dam, which is on Colorado River 64 mi. downstream from Boulder Dam, will take 5 years to complete. Contractor is combination of western firms headed by Utah Construction Co. Press Assoc. Photo

**NEW HOUSE OF COMMONS CHAMBER** at Westminster, England, (below) is erected on site of old chamber, wrecked by bomb in 1941. Shuttering and steel work are under way for formation of new reinforced foundations for building which will cost approximately \$5,025,000. American concrete mixer in background is of Chain Belt manufacture. British Combine Photo



# THIS MONTH'S NEWS REEL



**BIDS FOR ALLATOONA DAM AND RESERVOIR** on Etowah River near Cartersville, Ga. are opened and quotations read by COL. MARK M. BOATNER, JR., District Engineer, Mobile Army Engineer District. Low bid of \$13,292,088 was submitted by National Constructors, Inc., of Columbus, Ga., newly-formed combination of Hardaway Contracting Co., of Columbus, Arundel Corp., of Baltimore, Md., and L. E. Dixon Co., of Los Angeles, Calif. Total of \$17,400,000 has been set up for job, which will be completed in 3 years. Concrete dam will be 1,020 ft. long and 184 ft. high. U. S. Army Photo

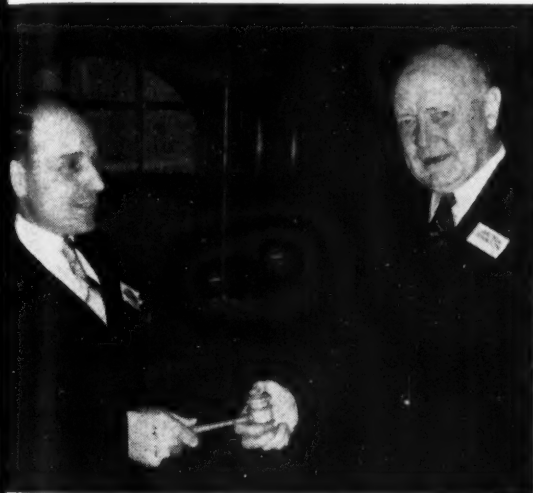




**HALTED BY WAR**, construction of Blue Mountain Dam, rolled earth-fill flood control structure on Petit Jean River 55 mi. southeast of Fort Smith, Ark., has been resumed by Southwestern Division, Corps of Engineers, U. S. Army, under \$1,010,448 contract with S. E. Evans Construction Co., of Fort Smith, Ark. Main body of dam, here shown 10 ft. below final crest elevation, will have height of

82 ft. and width at base of 650 ft. Spillway, located in natural saddle below left abutment, is concrete structure of uncontrolled chute type 150 ft. wide at crest. Outlet works include 20-ft. tunnel in right abutment, already completed, and long outlet channel. Project is in Little Rock District of U. S. Engineer Department.

U. S. Engineer Photo



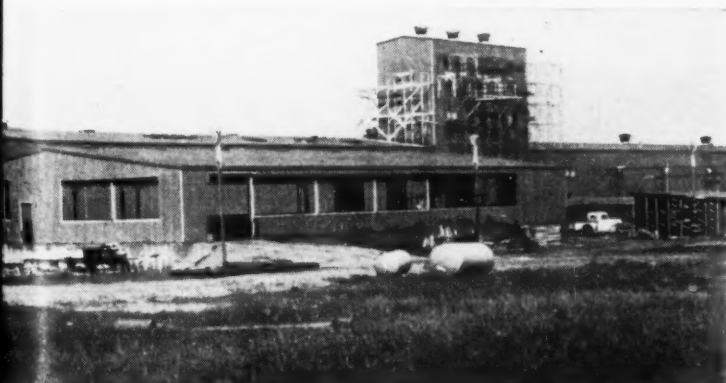
**NEW PRESIDENT OF THE MOLES**, New York organization of tunnel and heavy construction men, is **ALFRED N. WARWICK**, Long Island City builder and appraisal expert, here shown receiving gavel from outgoing president **ARTHUR A. JOHNSON** (right) at annual business meeting.



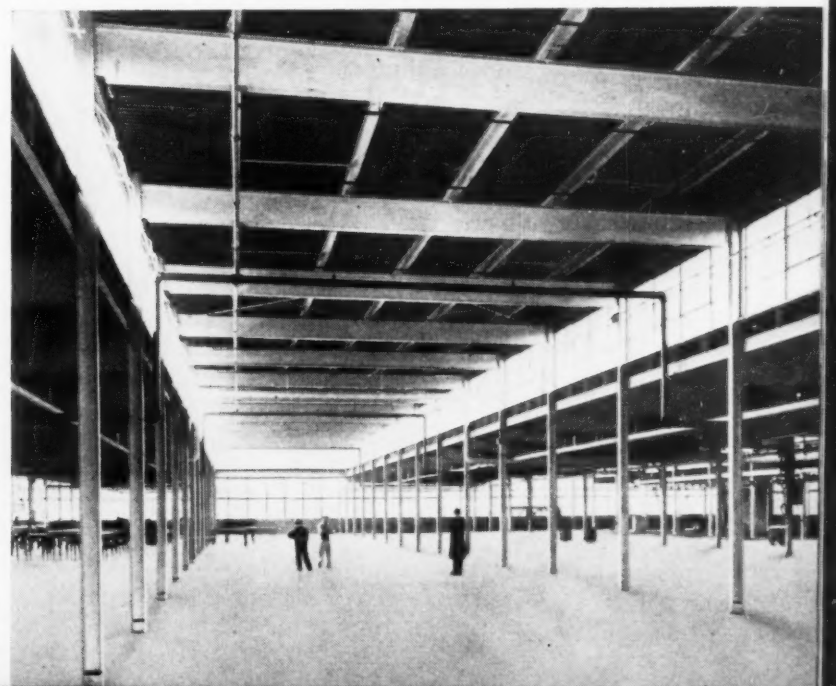
**PAN-AMERICAN HIGHWAY LINK** is forged at David in western Panama, by heavy road-building machinery to join routes of other Latin American countries and permit motorists to drive from South America to Canadian border.

Wide World Photo

**HUNGRY MARKET** for building felt awaits completion of this plant (below), estimated at \$600,000, for Certain-teed Products Corp., Dallas, Tex., by Meers Construction Co., Dallas.



**NEW PLANT** of Reynolds Spring Co., Trenton, N. J. (below), is of steel frame, insulated steel roof deck, steel sash and brick walls and concrete floor construction. Engineered and erected by Walter Kidde Constructors, Inc., of New York, building features large expanse of window and one-story construction.







# Machines Cut

By ROYCE KERSHAW

General Manager  
Royce Kershaw & Co., Railroad Contractors  
Montgomery, Ala.

**1** FIRST OPERATION in replacing old rail with new rail is uncoupling of bolted joints of old rail. This work is done with Nordberg wrenching machine at the rate of approximately one joint per min.

WORLD WAR II has brought about many changes in methods of doing all classes of construction work. Outstanding among them have been the methods and machines developed for reconditioning and constructing railroad track work. During the last decade, when it was necessary to do more work on the railroads, more men were added, but

during the last three years, when no extra men were available and more work had to be done, it became necessary to develop a number of new machines and methods in order to maintain the track in condition for moving war traffic.

Another important trend is now developing in the maintaining and reconditioning of railroad track

work. Ever since the railroads were first constructed, a section of 10 to 15 mi. was allocated to a crew of from 4 to 8 men, commonly called a section gang. This section gang maintained the particular section of track assigned to it, replaced old ties with new ties, did all the necessary surfacing, unloaded and placed new ballast, widened roadbed fills, cut weeds—in fact, did everything necessary to keep the track in good operating condition.

Maintaining railroads with these small gangs naturally resulted in higher cost per mile for maintenance since every operation, including the handling of material, was done by hand instead of by machines. For example, the old method of handling crossties was to allocate a certain number of ties to one section gang for a year's work. These ties would be unloaded by hand and stacked in a neat pile near the section houses. Later on, and as required, they were taken out in small numbers on push cars and placed in

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**2** PULLING SPIKES from old ties (below) is done with a Nordberg spike puller at the rate of about one rail length every 1½ min., using 3 men to operate machine.



**3** IMMEDIATELY BEHIND SPIKE PULLER three men using bars (below) throw old rail off ties, and directly behind this operations special cribbing machine equipped with revolving brushes cleans out ballast between ties and under rail, and sweeps tie clean of ballast and grit, so that adzing machines can adze tie for new tie plate. Approximately 18 men were required on this operation alone on first few miles of this work and after machine was developed, same work was done with 3 men.





# Cost of Railroad Track Work



L. S. JEFFORDS, chief engineer, Atlantic Coast Line Railroad, directs track rehabilitation project.



**4** TWO ADZING MACHINES of Nordberg manufacture are used to adze ties horizontally ready for new tie plates and new rail after tie plugs are driven in old spike holes. All tie seats are mopped with creosote oil after adzing. This work is done at rate of approximately one rail length every 1½ min.

the track by removing the ballast by hand, pulling the old tie over in the trench, removing it by hand, and replacing it by hand. This section gang also unloaded all the ballast on its section at the rate of two or three cars at a time, resulting in long waits for the local train to handle the ballast and other expensive delays and inefficiency in doing the work with a small gang rather

than with a large gang. In short, past practice has been continually to patch up the track, add an occasional tie, surface a small stretch, regage a certain portion rather than do a complete reconditioning and rebuilding job, as is the trend today. One-half mile of completely reconditioned track is considered a good week's work for the section gang outlined above.

Nowadays, by the adoption of production methods in reconditioned track, 2½ mi. of trackwork have been completely reconditioned in one week with the machines and methods outlined in this article. On peak days, more than 1,000 ties have been replaced, more than 3,000 ft. of track surfaced, and 50 cars of ballast unloaded by production methods that resulted in a lower unit

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**5** SPECIAL RAIL CRANE (below) operated by 5 men follows directly behind adzing machines and places new 130-lb. rail in position for bolting and spiking.





**6** ANGLE BARS are installed to connect new rails and are followed directly by another Nordberg wrenching machine to tighten bolts.



CONSTRUCTION PERSONNEL on railroad track project includes (left to right): W. J. ALDRIDGE, chief inspector, Atlantic Coast Line Railroad; ROYCE KERSHAW, general manager, and O. SMITH, general superintendent, Royce Kershaw & Co.



**7** GAGING OF TRACK and spiking every fourth tie is done by hand, followed by LeRoi 150-cu. ft. air compressor operating two Chicago Pneumatic spike drivers. This last operation completes relaying of new rail ready for traffic.

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**8** THREE MILES BEHIND RELAYING, trackwork (below) is retimbered and respaced. First operation of retimbering gang is accomplished by raising track 3 in., removing old ties, and placing new ties.



cost even with a higher rate per man-hour.

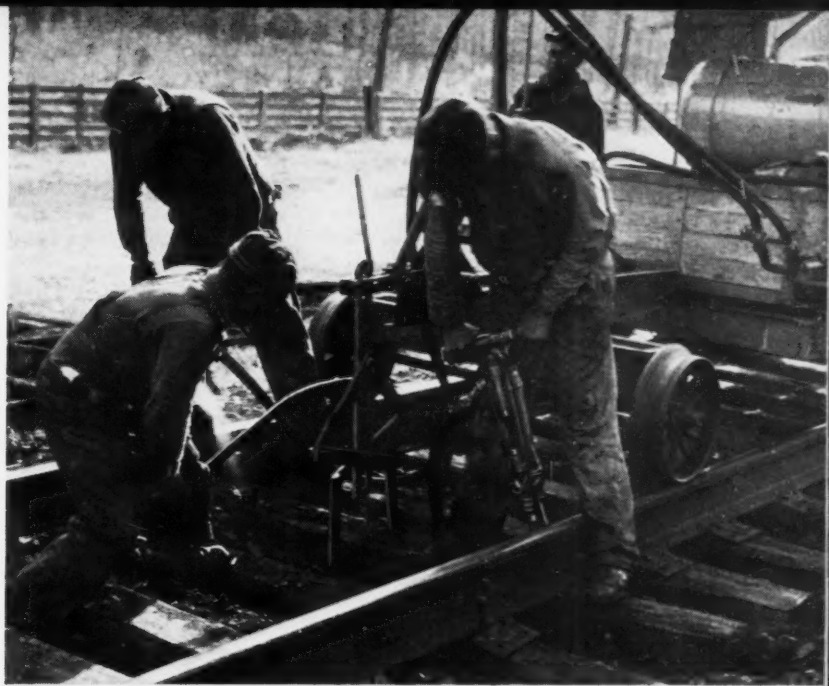
During 1945 the Atlantic Coast Line Railroad Co. awarded several million dollars' worth of work to private contractors for the complete reconditioning and reconstruction of certain portions of their track, releasing all of their own forces for use on normal maintenance work. Among these contracts was the work between Savannah, Ga., and Jacksonville, Fla., now being completed by Royce Kershaw & Co. This work was started during February 1945, and extended from Savannah to Back Swamp, a distance of approximately 49 mi. At the beginning of this contract labor was scarce and inexperienced, machines were difficult to obtain and the key men responsible for doing the work were confronted with the old methods of operating rather than the







**9** STRIPPING OF TRACK by removal of ballast is done by machine at locations where it is impractical to raise track for retimbering. This work is accomplished with a specially constructed machine operated by 2 men.

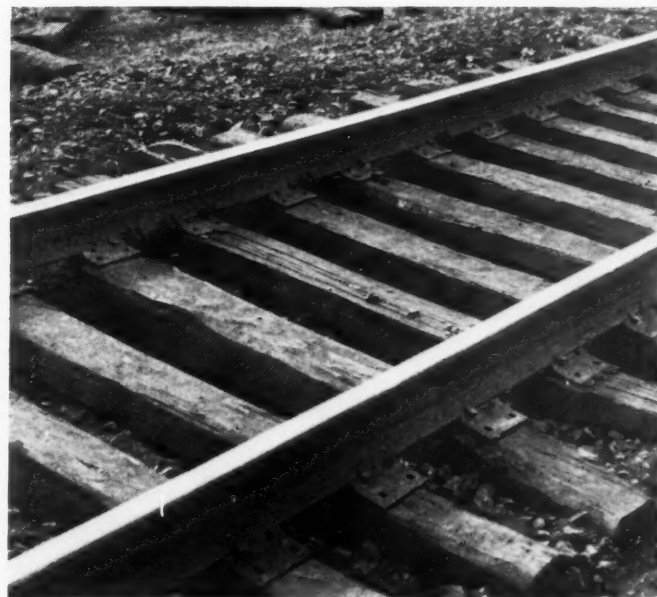


**10** AFTER OLD TIES HAVE BEEN REMOVED and new ties placed spikes are set by hand and finally driven with special pneumatic tie nipper and two Chicago Pneumatic spike drivers.

methods developed during the last 1½ years. Consequently, the work was started using old section force methods and tools.

After several miles of the work was under construction and a time study had been made of the cost of each operation, the contractor's engineers started work on machines to save time, cut costs, and do a better job. A time study engineer and a mechanical engineer were employed and assigned the job of developing a machine for those operations that were costing considerably more than the estimate. At the present time, a year after this work has been started, seven different trackwork machines have been developed in ad-

**11** COMPLETELY RECON-DITIONED TRACK, with new ties and new rail, is ready for first raise.



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**12** DIRECTLY BEHIND TIMBERING OPERATIONS, new granite ballast (below) is unloaded from hopper-bottom cars. Surfacing gang raises track about 4 in.



**13** ALL TAMPING is done with Jackson electric tampers (below) on this first surface. After traffic has used track approximately one week, final surface or raise is completed using another surface gang equipped with electric tampers.







**14** FINAL BALLAST SURFACING is applied after traffic has used track for approximately one week.



**15** DRESSING TRACK, after final surfacing and lining, is accomplished with special ballast plow and track dresser, using blade to remove ballast between rails and place it on shoulder.

dition to the machines already in use by the railroad.

An accompanying list tabulates all equipment used on this job. In the old days all of this work was done by hand and not one of the trackwork machines listed herewith was in use.

The work included removing 100-lb. rail and relaying with new 130-lb. rail, new tie-plates, spikes,

bolts, rail anchors, removing and replacing of ties that did not have an expectant life of at least 5 yr., removing all old worn out ballast, and addition of new granite ballast, elimination of a number of small vertical curves, and the completion of the track to the standard cross-section of the railroad company. The work was done as follows:

*Material Distribution*—All ma-

terial, including new rail, spikes, angle bars, bolts, joint compound, nut locks, tie plugs, creosote, rail anchors and tie plates, was distributed well ahead of all operations by work train. The rail was shipped in gondolas and flatcars and was unloaded with a full-revolving derrick, especially constructed by the contractor for this work. This full-

(Continued on page 160)

**16** DRESSING WINGS attached to sides of ballast plow (below) shape, dress and distribute ballast along shoulder of track. Machine is operated by three men and completes approximately ½ mi. of work daily.



#### EQUIPMENT FOR TRACK WORK

- 1 Kershaw 2-ton rail derrick
- 2 Nordberg wrenching machines
- 1 Nordberg spike puller
- 1 Kershaw cribbing machine
- 2 Nordberg adzing machines
- 1 Kershaw tie plate liner
- 1 Kershaw rail-laying machine
- 2 LeRoi compressors, 105 cu. ft.
- 4 Chicago Pneumatic spike drivers
- 2 Kershaw ballast removers
- 1 Kershaw tie bed cleaner
- 2 Kershaw pneumatic tie nippers
- 4 Jackson electric tamper units
- 1 Kershaw ballast plow and track dresser
- 3 Fairbanks Morse 40 motor cars
- 8 Fairbanks Morse push cars
- 1 Kershaw revolving crane

*Cited  
for  
Service*

EARTHMOVING has advanced in the last two decades from haphazard and crude operations to modern scientific methods through equipment development and application of engineering control. Prominent in this advance through the years has been Kenneth F. Park, now equipment consultant for the Caterpillar Tractor Co. His greatest contributions have been in the development of the carrying scraper, in the application of large low-pressure pneumatic tires to heavy equipment and in engineering analysis of large excavation operations.

Born in Arizona as the son of a globe-trotting mining engineer, Ken spent his boyhood days traveling with his father. After graduating from Staunton Military Academy he resumed his travels, but realized his ambition to obtain a technical education by getting a degree in civil engineering from I. C. S.

From 1910 to 1926 Park was in Alaska and Canada on engineering and mining work, including laying out the town sites of Seward and Anchorage. Upon returning to the States he spent three years with the Nevada Irrigation District, then joined the U.S. Engineers at Sacramento as an engineer on the Rio Oso levee job for which R. G. LeTourneau was contractor.

Here Ken first became interested in earthmoving equipment, for several million yards were being handled with the first large-scale application of homemade carrying scrapers. In 1931 he went to work for LeTourneau on the Boulder Dam



**KENNETH F. PARK**

Highway contract, where the same crude, steel-wheel scrapers were used. Meanwhile, LeTourneau had opened up a scraper manufacturing plant at Stockton, Calif., and had begun experimenting with tires.

In 1933 and 1934 Park traveled 120,000 mi. up and down the West Coast promoting the use of scrapers. On this assignment he became interested in applying engineering analysis to earthmoving through time and motion studies and a breakdown of detail costs.

Up to the start of the war Ken was involved in practically every big dirt job in the country, working with the contractors in planning operations and in checking equipment performance. Ever since the early days at Stockton he has been

studying the application of pneumatic tires to heavy machines, particularly in reference to flotation and performance, always maintaining that proper tires are just as important as a proper engine.

During the war he assisted the Corps of Engineers in establishing training courses and preparing training manuals. He also had a part in the design of the tank dozer.

Early in 1944 Park joined Caterpillar Tractor Co. Out of his long experience with earthwork projects has come one final conclusion: Earthmoving engineering should be a part of the contract procedure. Ken Park's contributions to construction have resulted in cheaper, faster and more efficient dirt-moving.



# WATER MAINS CLEANED AND LINED By Special Machines



WIRE BRUSH RING on rear of scraper gives final cleaning to main. Radial pipes shown here, hold coil springs and brush arms when individual brushes are used in place of ring.

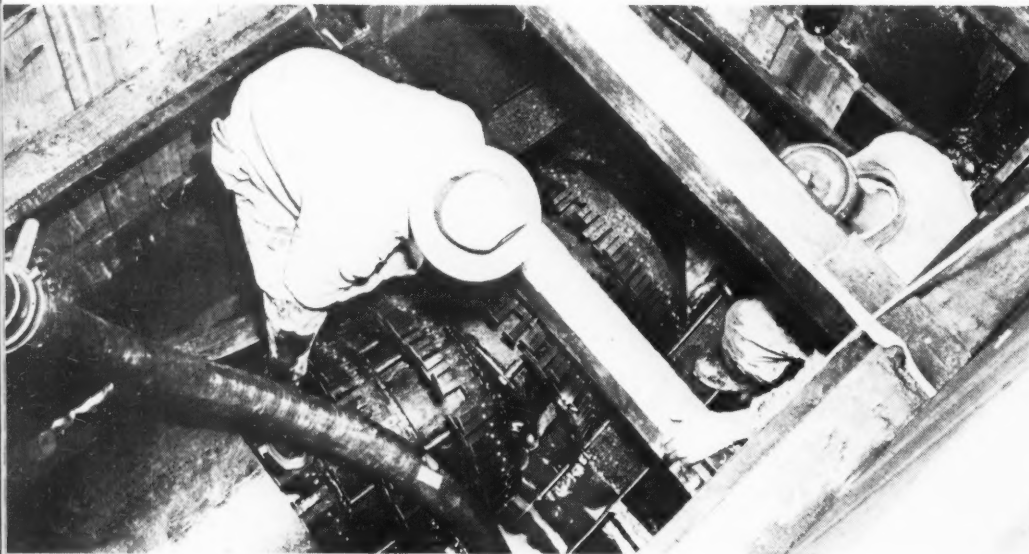
Wide World Photo

A KING-SIZE cleaning go-devil and a mortar-lining machine that performs like a whirling Dervish are being used by the Lock Joint Pipe Co., of East Orange, N. J., to eliminate hand scraping and hand finishing for the renovation of 74,000 ft. of badly-incrusted steel water main in Akron, Ohio. A pair of 30-year-old steel mains, supplying the city with water pumped from Lake Rockwell, is being cleaned and then lined with cement mortar to increase capacity.

Two parallel mains, each 37,000 ft. long, cross-connected about every 7,000 ft., are being reconditioned. The mains are 36-in. and 48-in. lock-bar steel pipe with riveted circumferential joints. Sections of pipe between cross-connections are cleaned and lined in sequence, while the flow is diverted through the parallel main.

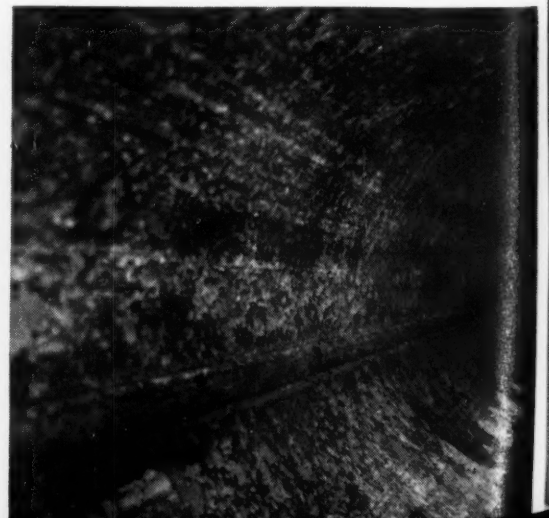
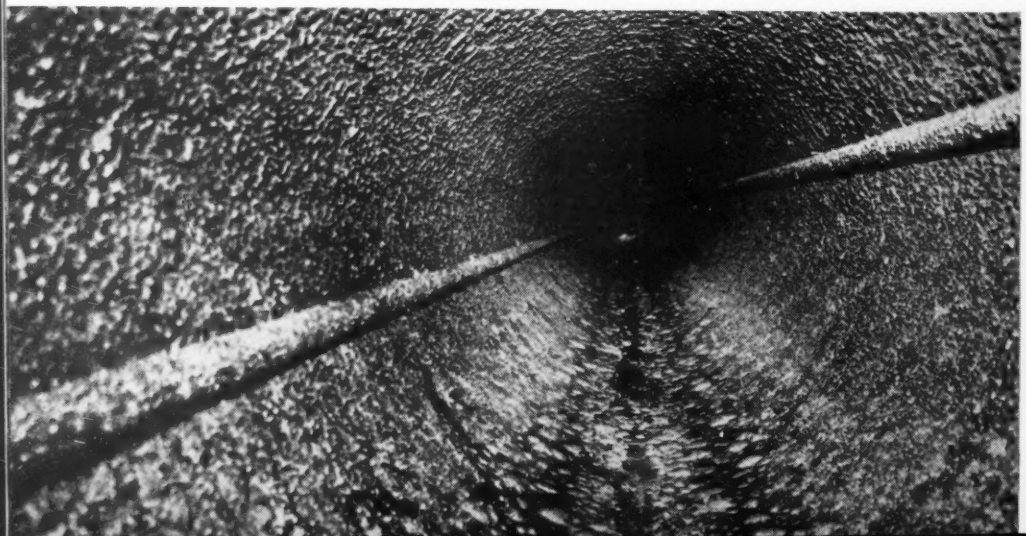
## Pipe Cleaning Machine

A 2,200-lb. go-devil, developed by the National Water Main Cleaning Co., New York, is used for cleaning the pipes. The unit consists of a two-section articulated scraper



GO-DEVIL EMERGES from lower end of 7,000-ft. section of 48-in. water main after being forced through by water pressure. Hooked scrapers clean off all incrustations from pipe walls. Scraper unit is articulated to traverse standard elbows.

TWO PASSES OF GO-DEVIL and one of lining machine (below) transform tuberculated pipe (left) into smooth-surfaced mortar-lined main (right). Multiple scrapers on go-



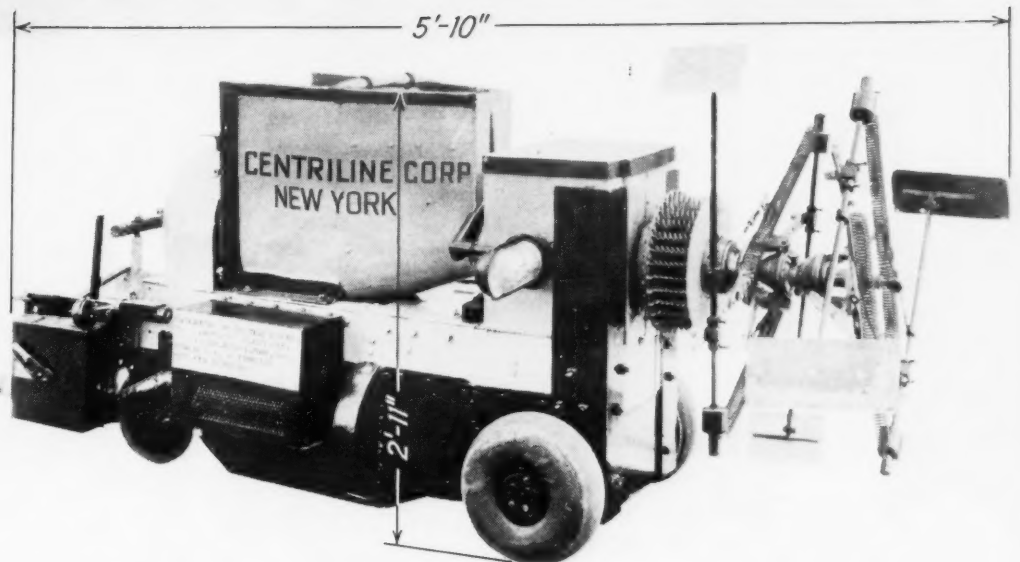
barrel, to each section of which are affixed three circumferential rings carrying hooked scrapers of spring steel which bear against the inner surface of the pipe and thus scrape off the incrustations. A bulkhead inside the leading section of the barrel dams the water flow through the main so that sufficient pressure is built up behind the go-devil to force it through the pipe. The scraper heads overlap to insure complete pipe coverage and the scraper shanks are necked down so that some water will escape through them between the scraper barrel and the pipe wall to flush out the scrapings. A wire brush ring on the unit's trailing edge gives a final cleaning to the main.

#### Go-Devil Operation

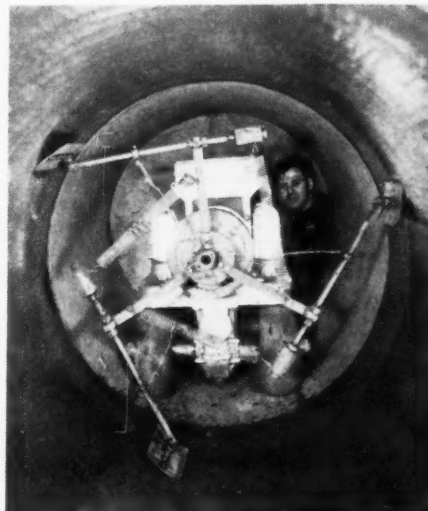
In operation, an access pit is excavated at each end of the 7,000-ft. section to be reconditioned and two 8-ft. lengths of pipe are burned out for the entrance and exit of the go-devil. The scraper is inserted into the upstream 8-ft. pipe section and this section is replaced and held in the line with gaskets and couplings. A shut-off valve behind the scraper unit is opened and the water flow is adjusted to maintain a pressure against the go-devil bulkhead that will give the unit a speed of from 100 to 200 ft. per min. The water escaping around the periphery of the scraper flushes the scrapings to a sump and pump temporarily installed at the lower open section of pipe. Two passes of the go-devil remove all deposits, after which the cut pipe sections are welded in place and the excavations back-filled.

A  $\frac{3}{8}$ - to  $\frac{5}{8}$ -in. cement mortar

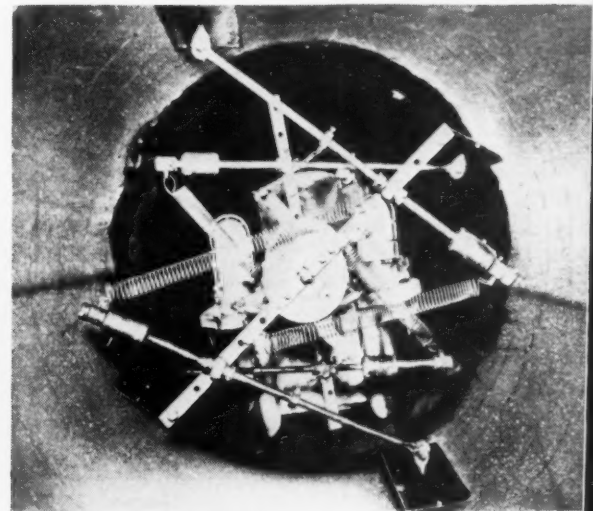
(Continued on page 66)



**MACHINE FOR LINING 48-in. main** throws cement mortar against pipe walls from fins on rapidly rotating distribution head adjusted to pipe center line. Rotating paddles trowel surface to smooth finish. Electrically-propelled machine has tractive power on rear tires while steel front wheel furnishes electrical ground to eliminate accidents.



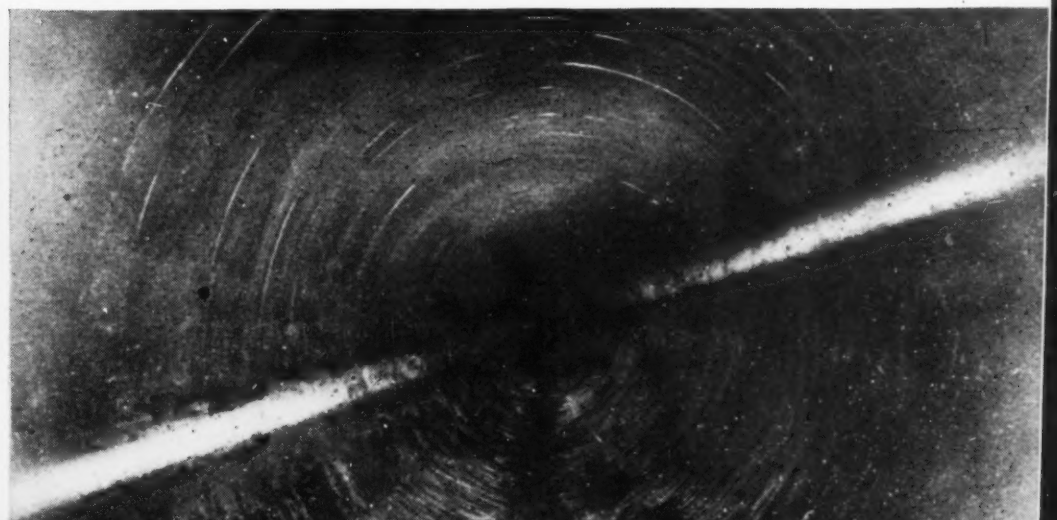
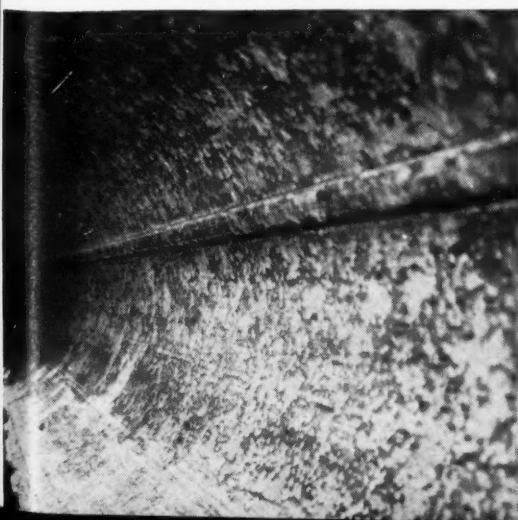
**COMPACT UNIT**, only 4 ft. long, for use in 36-in. pipe is modified on another job to use only 3 paddles. Note comparatively smooth surface of untroweled ring of lining between paddles and body of machine.



**CONTRA-ROTATING SETS** of paddles, to the rear of the placing head, trowel the lining to a smooth, hard surface. Small size of machines enables them to negotiate and line, but not trowel, standard bends.

Wide World Photo

...pers on go... hand cleaning and leave pipe (center) ready to receive  $\frac{3}{8}$ - to  $\frac{5}{8}$ -in. cement mortar lining. Lining is cured by condensation inside main. Wide World Photos







British Information Services Photos

**LIGHT STEEL FRAME** of cold-rolled sections and ladder-like welded panels 3 ft. 2 in. and 6 ft. 4 in. wide are features of 2-story Braithwaite house. Several types of sheathing, including brick, asbestos-cement panels, vitreous enameled steel sheets and stone masonry are used, according to requirements of local authorities. Patented spring clips, in lengths up to 10½ ft., fasten sheathing to framework. Floor and roof beams are inverted U-shaped members of light-gage steel. Floors are 2½-in. thick lightweight concrete slabs in kitchen and stiffened plywood panels in other rooms.

## BRITISH HOUSING

Planned for Bombed Areas

and New Estates

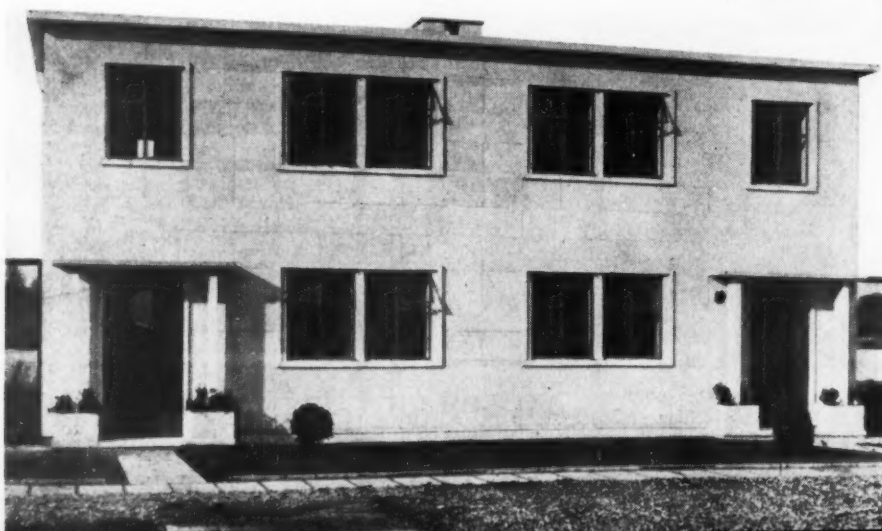
By JOAN LITTLEFIELD

British Information Services  
London

**REINFORCED CONCRETE FRAME** (below) of 6¼-in. square posts, precast beams and cavity walls for thermal insulation characterize the Orlit house, a two-story, three-bedroom structure. Walls are of thin precast concrete slabs and blocks, with an air space between them. Vertical joints between slabs are made with bitumen-soaked fibrous material in grooves in slabs. Horizontal jointing is with cement mortar or special putty.

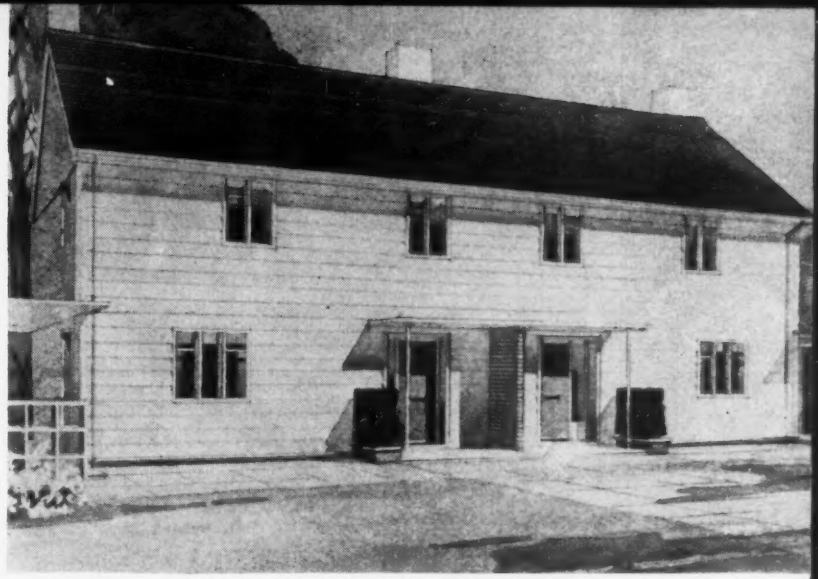
**FACED WITH THE NEED** for providing 750,000 homes with a labor force still only half its pre-war strength of 1,000,000, and acute shortages of brick, slate, glass and other essential materials, the British Government, aided by local authorities and architects, is yet trying to plan its housing program both practically and esthetically. Every effort is being made in the bombed areas and on new estates to design what is called a Neighborhood Unit, containing its own shops, school, community center, library, and clinic.

Many London boroughs have schemes ready to go into operation the moment men and materials are available. On a 9¾-acre estate in Becher St., Kensington, the local council is to erect 302 dwellings, giving a density of 32.5 homes and 136 persons per acre. There will be 20 houses of six rooms for the





**NON-TRADITIONAL** is term employed to describe this type of house designed for large-scale production by British Iron and Steel Foundation. In groups of 50 or more these units are for use in urban areas. External walls are of corrugated sheet metal treated to resist corrosion.



**PRECAST CONCRETE** is material employed in construction of Airey two-story house, designed especially for rural sites.

larger families up to eight persons; 48 four-room apartments for families of five; 24 larger four-room apartments which will accommodate six; 96 three-room apartments for four persons; and 18 one-room apartments for single people. These will be contained in three-story blocks. There will also be eight-

story blocks, comprising 64 three-room apartments for four persons, and 32 two-room apartments for two.

Camden Town, St. Pancras, Hackney and Finsbury have similar plans, while near-country estates at Letchworth, Loughton and other places on the fringe of London are

designed to include open spaces, trees, playing fields. At Letchworth, a group of 2,000 houses is planned.

On the 558-acre site at Loughton, Essex, where the London County Council plans permanent prefabricated steel houses, Loughton Hall,

(Continued on Page 154)

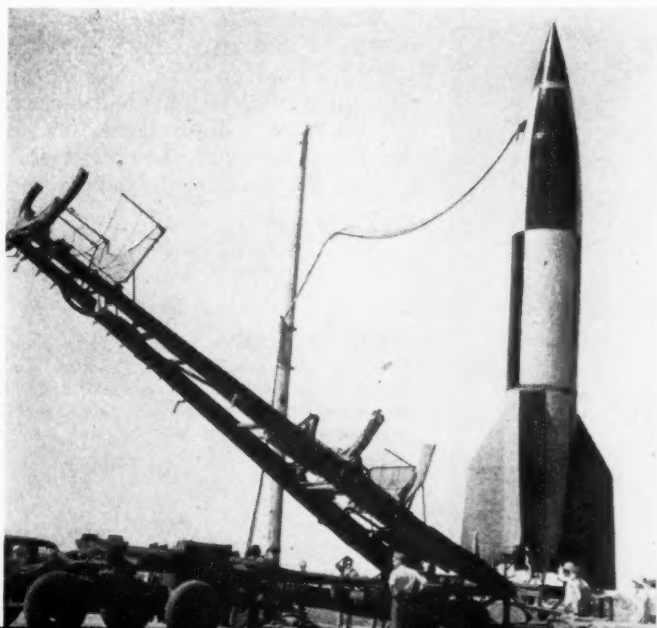
## IT'S A MEILLER "WAGEN"

**THIS STRANGE CONTRAPTION** is a combination rubber-tired trailer and hydraulic erecting crane, brought over from Germany for handling the rebuilt V-2 rocket recently tested by the U. S. Army Ordnance Dept. at White Sands, N. M. Still known by its German name of Meiller Wagen, the rig transports the rocket to the launching platform, sets the missile in place on its tail and then assists in pumping various fuels into the rocket innards.

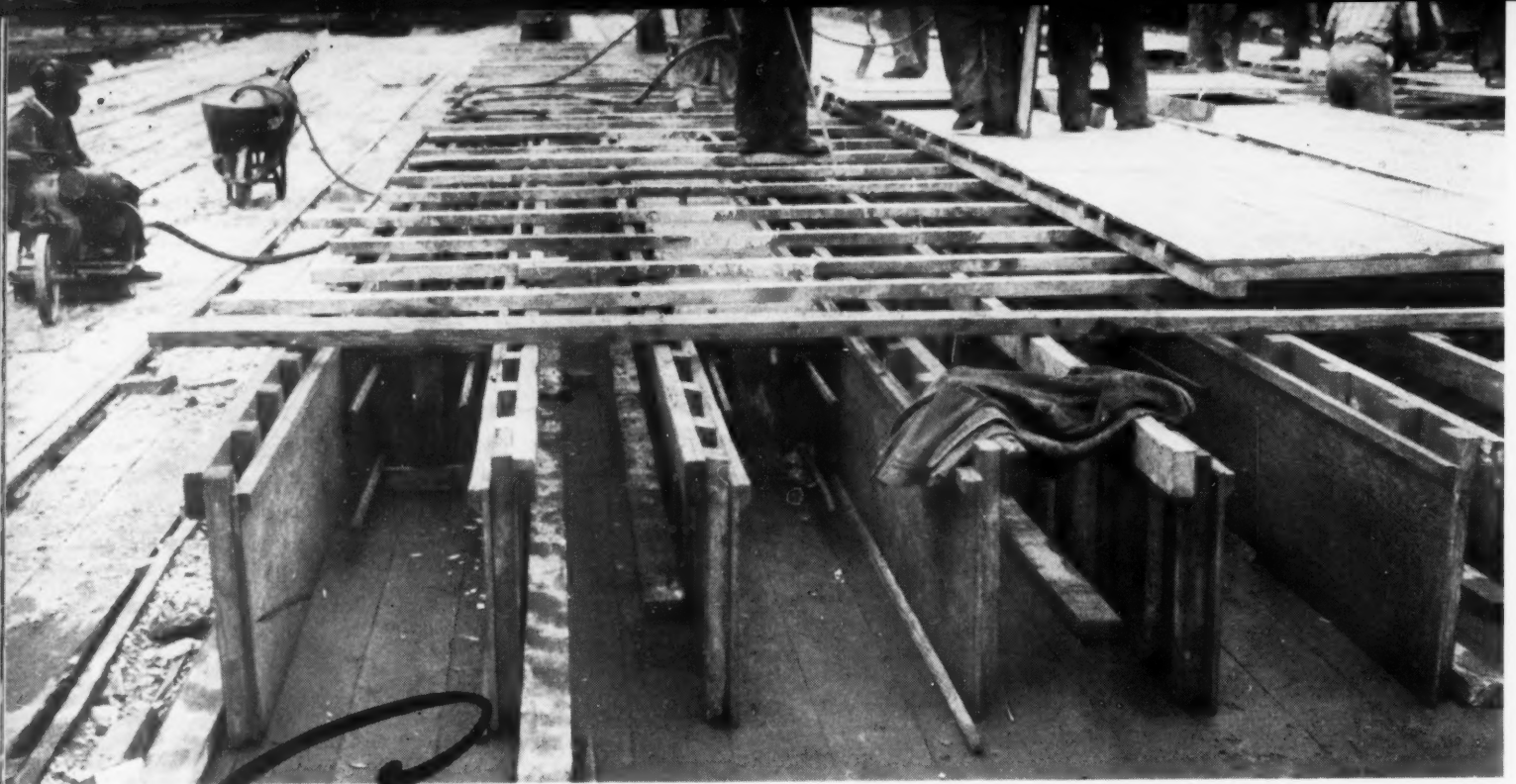
In the accompanying illustrations the size of the trailer-erector is shown by comparison with the

rocket, which is 46 ft. long, 5.4 ft. in dia. and 11.7 ft. across the fins. The rocket weighs 5 tons unloaded, 14 tons fueled and primed ready for a tour through the stratosphere.

The Meiller Wagen is a pipe-frame trailer with a structural-frame erector arm which is tipped from horizontal position on the trailer to vertical position for setting the rocket by a pair of hydraulic jacks similar to those on our dump trucks. Outriggers steady the rig during placing of the rocket. The tractor is carried on eight large pneumatic tires.







# Simple forms

## CUT PILE CASTING COSTS

SIMPLE PLYWOOD PANELS, held at bottom by rails nailed to platform and at top by cross-rails that also serve as runway supports, make up forms for first stage of concrete pilecasting sequence. First forms are so spaced as to permit casting alternate set of piles between those of first set.

INGENIOUS USE of one set of precast square concrete piles as form supports for an alternate set poured the next day is resulting in unusually low form costs on Tidewater Construction Corp.'s pile-casting job for a Navy pier at Norfolk, Va. The contractor is taking advantage of the fact that the piles must remain in original casting position on the platform at least seven days for

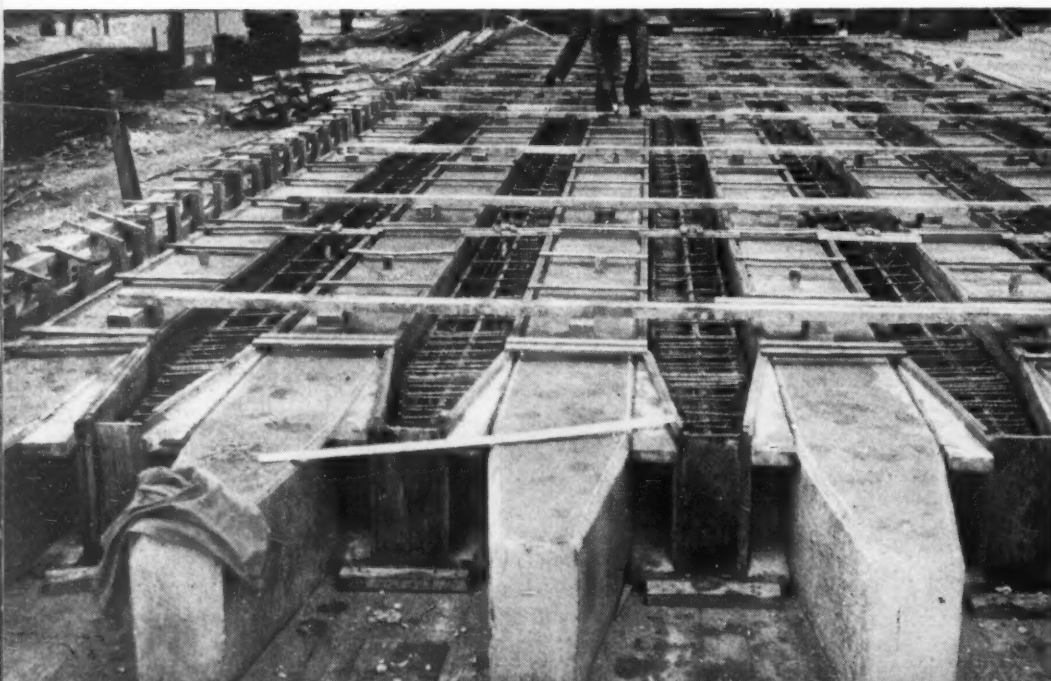
curing. Forms for the first group of piles poured on a platform are accurately spaced to permit, after the first forms are stripped, insertion of  $\frac{3}{4}$ -in. plywood liners against the pile sides as the forms for the second set poured between the individual piles of the first set. The liners, plus end bulkheads, are all the forms necessary for the second group of piles.

The piles are 18 in. square, reinforced with cages made up complete in advance with welded longitudinal bars, and placed as a unit. Piles vary from 60 to 87 ft. in length. In the casting sequence, longer piles are always cast in the first group so forms for the second group lie entirely within the slots between the first set.

The pile-casting yard is divided into three casting platforms, each accommodating a maximum of 24 piles. Only one set of forms, serving all three platforms, is required for the first group, though three sets of liners or intermediate forms are needed for the second group, as they cannot be stripped until the piles are cured and lifted.

Along one outer edge of each platform is a permanent form, securely anchored and held by outside knee braces. This is the anchor for all other panels used for casting the first group. The other forms of this set are simple panels made

← PLYWOOD LINERS against piles poured previous day are forms for second group. Alternate piles cast in second stage are always shorter than those in first set. Runway supports for second pour are blocked up on first piles.





**TRANSIT-MIX CONCRETE** is delivered to buggies at casting platforms for distribution to forms. Knee-bracing for outside form panel at right of platform is only bracing required for entire form system. Rest of form panels for first group of piles are spaced and held erect by top transverse rails tied into braced panel.

up of plywood sheeting, 2x4-in. studs and a single 2x4-in. top rail. The panels are spaced and held at the bottom by 2x4-in. bottom rails nailed to the platform with double-headed nails for easy stripping. Notched 2x6-in. templates placed across the tops of the panels, including the permanent form at the edge, automatically plumb the panels and hold them erect until 2x6-in. transverse rails can be nailed, also with double-headed nails, across the tops of the side-form rails. These transverse rails not only brace the form panels, but also serve as the base for buggy runways and working platforms. As the side panels are 24 in. high, there



**RICHMOND SCREW ANCHOR**, (below) consisting of screw bolt and spiral shell, is held by carpenter foreman C. W. McDANIEL. Bolt and shell are cast into pile at lift points; bolt is removed and replaced with eyebolt screw for lifting.

**LINER PANELS** for second group remain in place until all piles are lifted from platform after minimum 7-day curing period. Plugs in top pile surfaces protect lift sockets.

Page 87



→  
**EYEBOLT LAG SCREWS** are screwed into spiral shell cast in the piles for lifting.







**STRONGBACK** handled by revolving steam traveler lifts piles from platform and places them on barge for transportation to job. Equalization of three point suspension is by dead-ended cable reeved through six multiple sheave blocks.

is plenty of room beneath the transverse rails for finishing. Corner chamfers on the piles are formed by  $\frac{3}{4}$ -in. triangular molding nailed to the bottom of the side panels and at top strike-off level.

Intermediate forms for the second group of piles are simple plywood panels with the chamfer

molding nailed in place. They are supported entirely by bearing against the sides of the previously-poured first group. For the second stage concrete placing, the runways and working platforms are blocked up on the first group of piles. All contact form faces are carefully cleaned and oiled between uses.

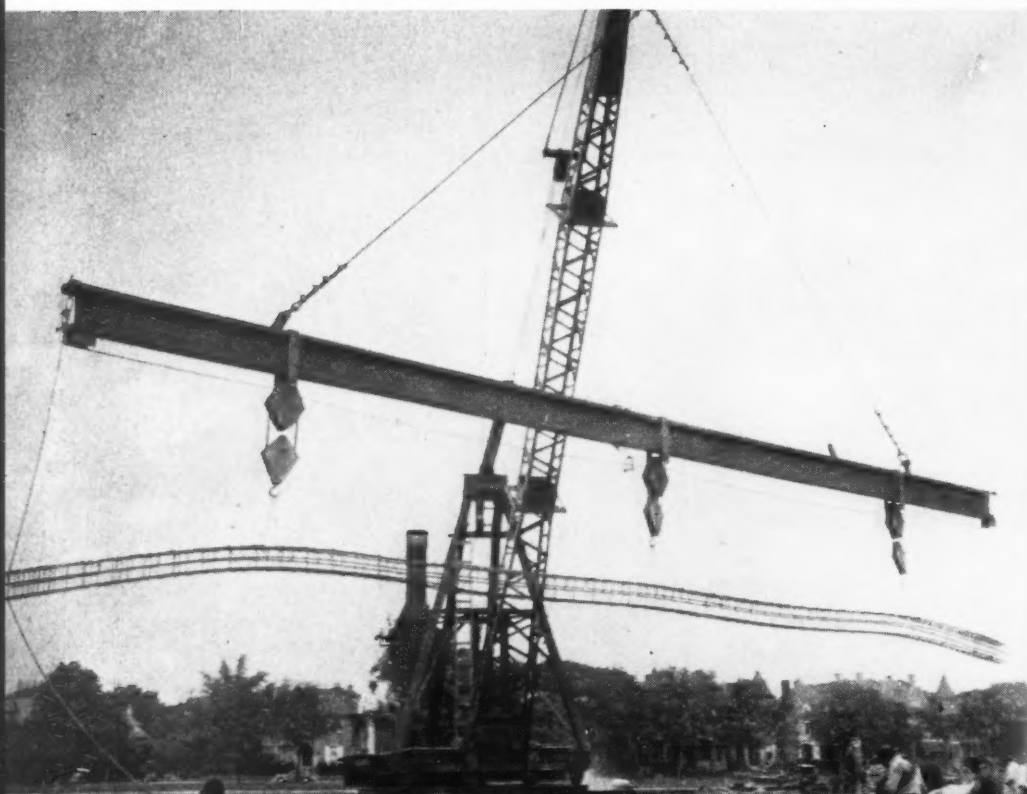
All concrete is transit-mixed, delivered to the casting platform in transit trucks by Southern Materials Corp. Trucks discharge concrete direct into buggies on the runways for final distribution to the forms. The concrete is vibrated with internal-type vibrators and is float finished. A liquid curing compound is sprayed on to the top surface immediately after the concrete is finished.

A full-revolving steam crane, mounted on wide-gage tracks, lifts the completed piles from the platform and moves them either to storage or direct to barges in a slip alongside the casting yard for transportation to the pier job. The crane also places the reinforcing cages. It is propelled by a double-drum gas hoist at one end of the crane runway through direct and back-haul hoist lines.

The traveler is equipped with a heavy I-beam strongback from which hang three hooks on multiple-line sheaves reeved up to equalize the lift at all three points. This is accomplished by three multiple sheaves fastened to shackles on the strong back, each of which supports another multiple sheave carrying a hook. A single wire rope, dead-ended at each end of the beam, runs

*(Continued on page 159)*

**REVOLVING TRAVELER** (below) also places prefabricated reinforcing cages in forms.



# GARRISON DAM

## Biggest Dirt-Moving Job Since Fort Peck

PLANS JUST REVEALED by the U. S. District Engineer at Omaha, Nebr., show that the Garrison Dam scheduled to be built on the Missouri River above Bismarck, N. D., will be the biggest dirt-moving job since the completion of Fort Peck Dam on the same stream in Montana. The comparison between Fort Peck and Garrison ends, however, with the fact that they are both huge earth fills on the same river. Except for base preparation and topping out, Fort Peck's 122 million cu. yd. embankment was a hydraulic fill pumped into place by four dredges working in the river. Garrison will be a 75 million cu. yd. dry rolled fill, with every yard of dirt mechanically placed and then compacted to specified density.

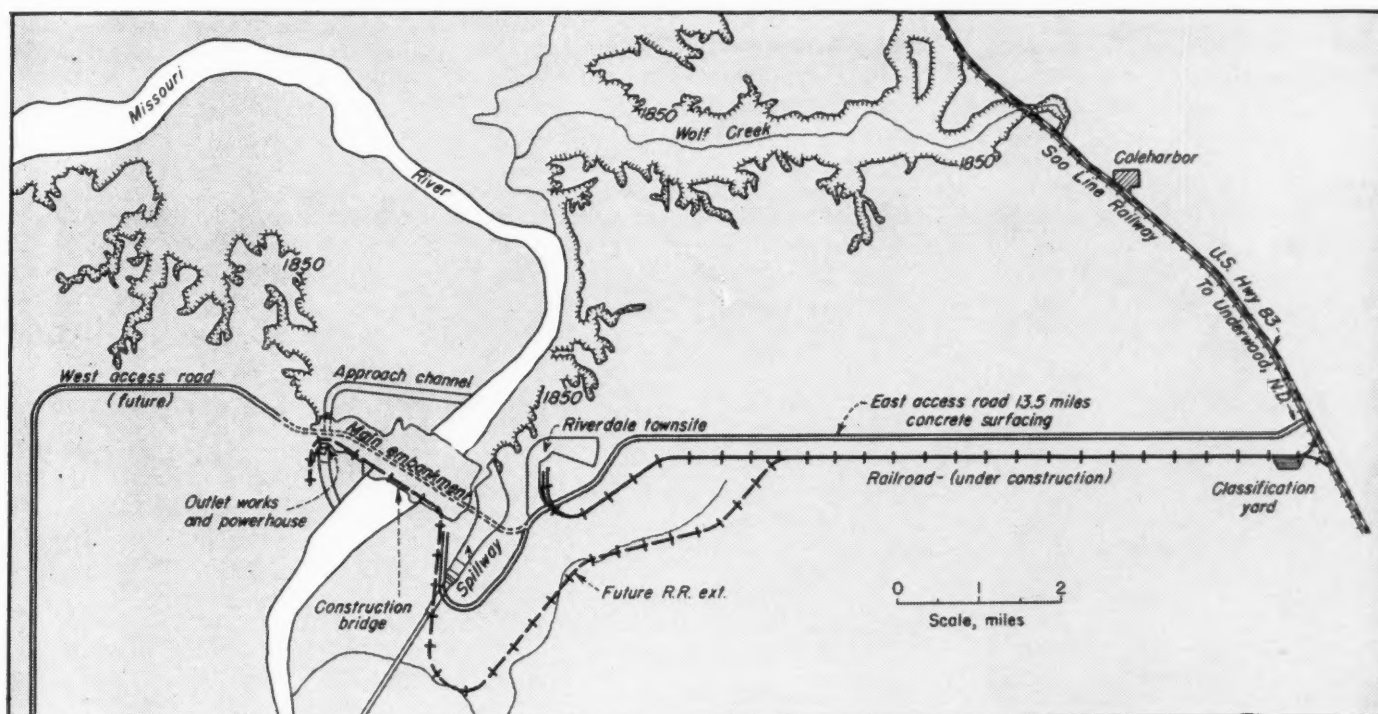
Borrow pits will be no problem at Garrison, for the entire 75 mil-

lion cu. yd. fill will come out of the spillway and outlet channel cuts with some 4 or 5 million cu. yd. to spare. However, about 2,000,000 cu. yd. will be borrowed off adjacent banks for diversion embankments and channel filling in the first stages. The spillway cut, located in the left or east abutment, will require 55 million cu. yd. excavation, and the outlet conduits, in the right abutment, will require an additional 25 million cu. yd. excavation. Spillway cuts range up to 240 ft. in depth. The spillway approach channel, roughly 1,600 ft. wide and 3,000 ft. long, will yield 29 million cu. yd., while another 25 million cu. yd. will come out of the spillway chute. A 10,000-ft. approach channel leads to the outlet and control conduits, which will be about 1,800 ft. long between in-

take and power house. These works are in the right or west abutment.

Along the axis of the dam the river banks are 3,500 ft. apart, though here the river is split into two channels by an island 1,500 ft. wide. The river will be shifted to the west channel during the early stages of construction to balance the fill on each side until the diversion through the outlet conduits can be made. A steel sheet-pile cutoff wall to firm material is contemplated that will seal off the varying sand formations under the damsite.

Except for the sand in the river bottom and some miscellaneous overburden, the principal material to be excavated is known as the Ft. Union formation. This is described as a thick deposit of well-consolidated clay and silt, of shallow sea or continental origin, formed during



GARRISON DAM PROJECT includes world's largest rolled-fill embankment, the construction town of Riverdale, a railroad connection to the Soo Line, and a concrete access highway.



the Tertiary Age. It is fairly hard, though uncemented, its strength being derived principally by compaction under great depth of later deposits (since eroded away) and the glacial ice cap, estimated 1,000 ft. thick. The formation contains some sand seams, and occasional streaks of lignite, the latter from a fraction of an inch to 15 ft. in thickness. For varying depths, though all shallow, the top part of the formation is weathered into a softer mixture of clay and silt.

Tests in building an embankment under a special contract have shown the Ft. Union formation can be placed and compacted to the desired density in the dam with little or no addition of water. Overburden and weathered material placed in the dam will have to be sprinkled during compaction.

The Ft. Union material can be excavated by either shovel or scrapers without blasting, though

perhaps some ripping might be required for scraper work. Thus, the possibilities are wide open for any one or a combination of dirt-moving methods, including shovel, dragline or scraper loading, with truck, wagon, scraper or belt conveyor haul and distribution. Specifications will require spreading in layers and roller compaction.

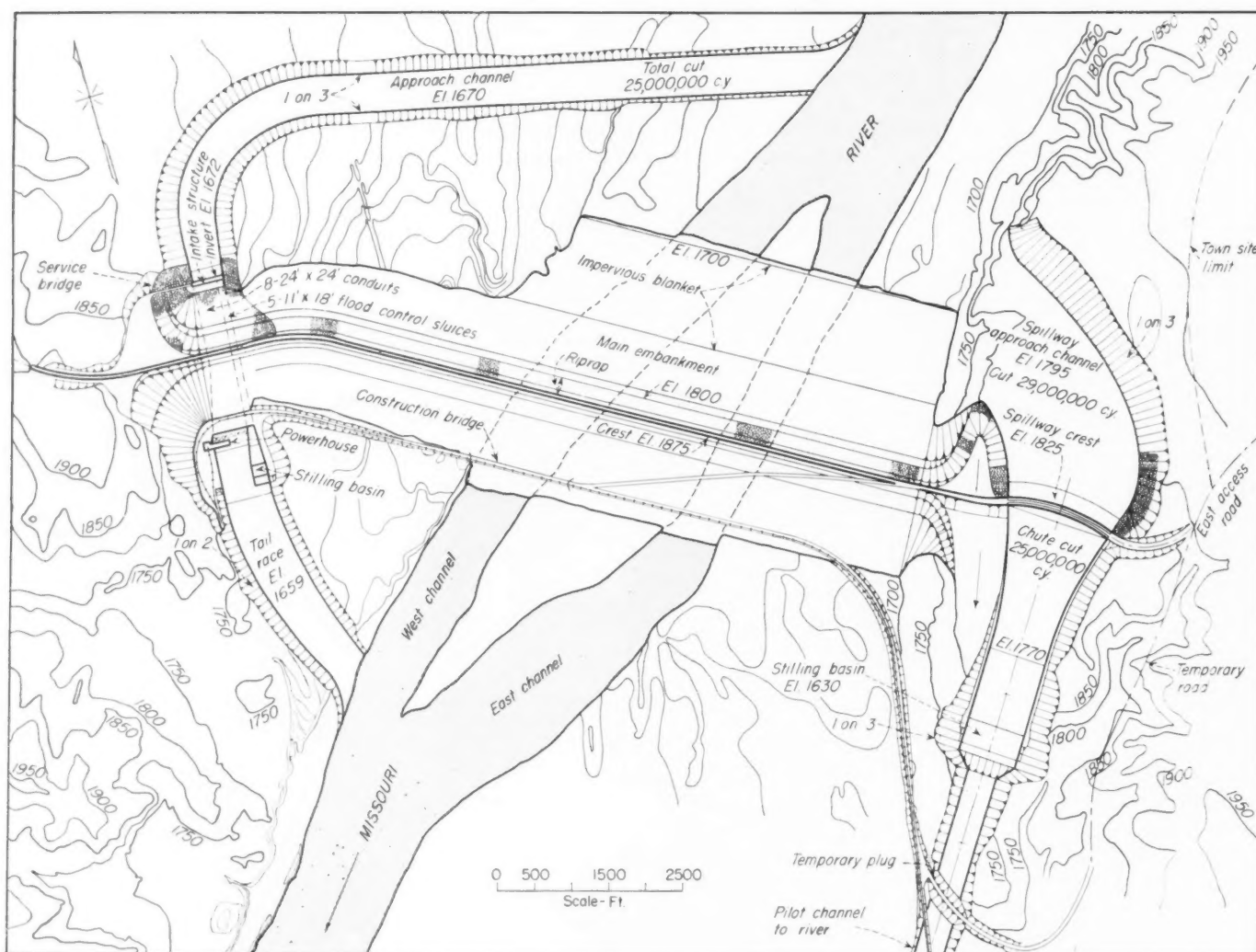
#### Six-Year Construction Schedule

While the rate of construction will depend largely on the rate of appropriations and amount of yearly allotments decreed by Congress, preliminary studies indicate a six-year progress schedule as possible and logical for the main project. This would mean an average annual placement of 12½ million cu. yd. in the main embankment. As site preparation and finishing and topping out will restrict the yardage placed in the early and final con-

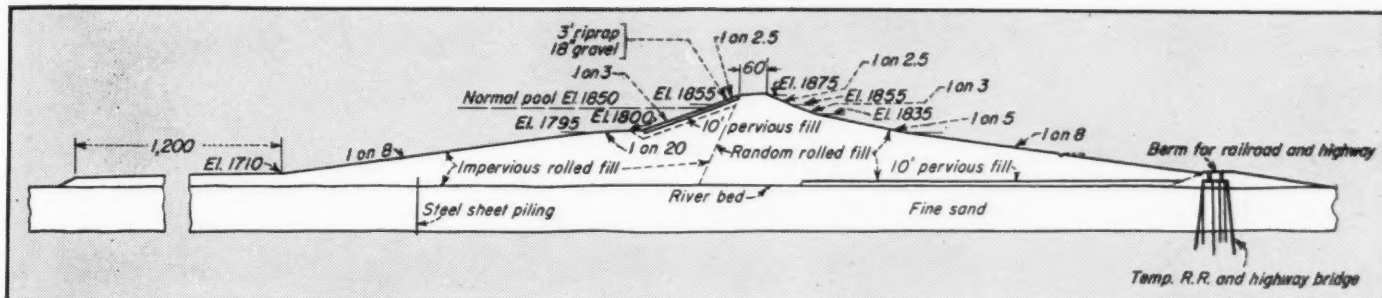
struction stages, respectively, the average annual quantities probably will be increased as much as 50 percent during the middle of the construction program.

Thus, the contractor faces the problem of moving and placing perhaps as much as 18 million cu. yd. in one season. Average weather conditions in North Dakota will permit fill placing between Apr. 1 and Nov. 1, a seven-month period. On such a basis the contractor would have to be geared up to place about 2½ million cu. yd. per month during the heaviest part of the construction schedule.

Until the outlet works are completed for river diversion, which will be well along in the construction schedule, the main embankment will have to be placed in two sections, leaving the center section open for the river flow. While mass diagrams for the earthmoving have not yet been completed, rough cal-



RELATION of spillway and outlet works to main dam. All of 75 million cu. yd. of embankment fill will come from the spillway and outlet cuts with several million yards to spare.



**FILL CLASSIFICATIONS** in the main dam, shown here in maximum section, are simply pervious, random and impervious fills. To level off the damsite, some of the first fill will be placed under water.

culations show that the haul will average about 1 mi. for the embankments on each side of the channel and about 1½ mi. for the center closure section.

Present plans contemplate calling for bids on a single contract for all excavation and fill by the end of this year, so dirt moving can begin next season. A separate contract will be let for the spillway concrete and structures. Decision has not yet been made whether to include the outlet conduit concrete with the excavation contract or to let that work separately, though the power house and all mechanical installations will be included in separate contracts.

In volume Garrison Dam will be three times as large as the present biggest rolled fill, Denison Dam on Red River. Garrison will have a crest length of 12,000 ft., will rise 210 ft. above the river bed, and will be about a half mile in base thickness from toe to toe, not including an impervious blanket extending 1,250 ft. upstream from the upstream toe. The upper part of the upstream slope will be covered with heavy riprap. Embankment slopes and fill classifications are shown in the accompanying cross-section. River bed is about El. 1665, and crest of dam will be El. 1875. The concrete spillway lip will be El.

1825, surmounted by tainter gates 29 ft. high.

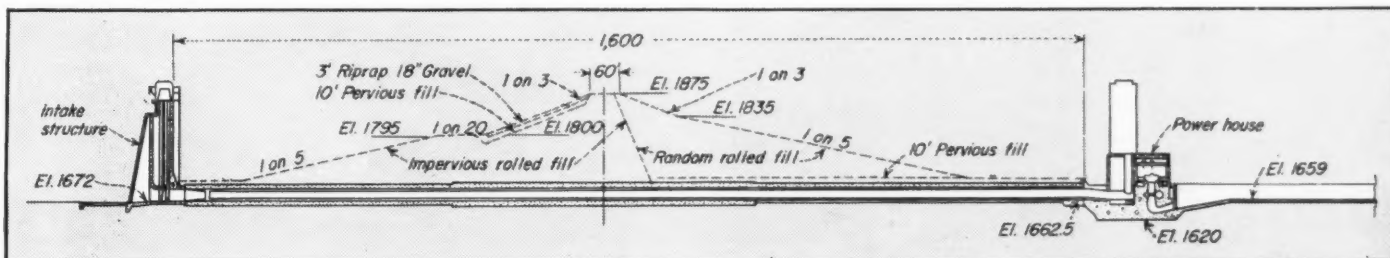
Despite the fact that Garrison is primarily an earth dam, only four dams contain more concrete—Grand Coulee, Shasta, Boulder and Fontana—for the outlet and spillway structures will require 2,000,000 cu. yd. of concrete. The outlet works, of cut and cover design, consist of eight 24-ft.-dia. concrete conduits, which will eventually carry 18-ft.-dia. steel penstocks, and six 12x23-ft. concrete flood control conduits. All conduits will be required for river diversion during construction. An intake structure, 470 ft. long and 230 ft. high, will control the water flow through the conduits after the dam is completed. Eventually the power house, at the lower end of the conduit, may contain eight units, but probably only half of the power house will be built initially, with only two 40,000 kw. units out of the ultimate eight installed. The outlet works will require 1,200,000 cu. yd. of concrete.

The spillway and 3,500-ft. length of paved spillway channel will account for another 800,000 cu. yd. of concrete. From the spillway lip the channel slopes down to a stilling basin. From the lower end of the paved channel a long pilot channel will be cut out to the river.

Contracts have already been let

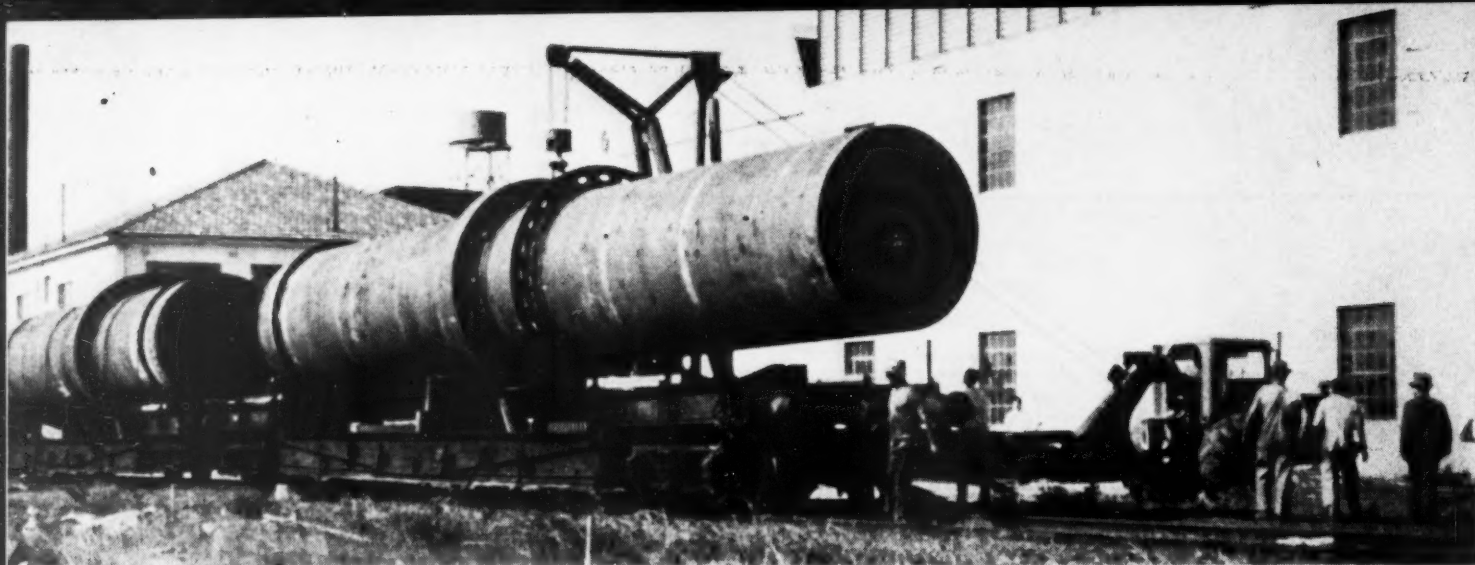
for the access railroad and highway and for a 1,350-ft. deck-girder and pipe-pile bent construction bridge across the river at the toe of the dam. Wm. A. Smith Const. Co., Houston, Texas, got the contract for building the first 10 mi. of the railroad, \$398,315, involving 170,000 cu. yd. of earthwork. Contract for 13½ mi. of access road was let to S. J. Groves & Sons Co., Minneapolis, for \$1,163,000, with 1,200,000 cu. yd. earthwork. The construction bridge went to Missouri Valley Constructors—Winston Bros. Co., for \$1,303,000. Bids were opened on May 17 for part of the construction town, known as Riverdale, to be located on the east bank above the spillway.

Garrison Dam is one of the U. S. Corps of Engineers projects in the joint Bureau of Reclamation-Engineer development of the Missouri River valley. Brig. Gen. Lewis A. Pick, as Division Engineer, Missouri River Division, is in general charge for the army. All design work and construction supervision are under the Omaha District, U. S. Engineers. Lt. Col. Delbert B. Freeman is District Engineer. W. E. Johnson is chief of the engineering division of the District. John W. Sibert Jr., is area engineer in charge of construction at the dam.

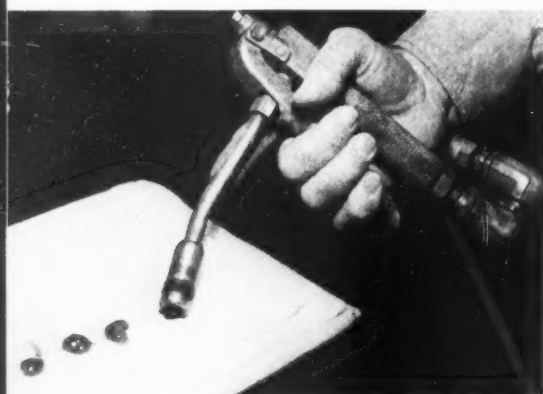


**OUTLET CONDUITS** are to be built by cut-and-cover method in right abutment. This longitudinal section through conduits, which will serve first for river diversion and later as penstocks and flood sluices, shows how embankment slopes are steepened over outlet works.





**HUGE DRYING KILN** is unloaded from flatcar at Sydney, Australia, plant of Cream O' Tartar Corp. by 20-ft. Tournac crane. This rubber-tired rig then carries hard-to-handle kiln up 100-ft. ramp and sets it on prepared foundation.



←  
**TIME AND LUBRICANT** can be saved by proper use of power gun in servicing equipment. Three lower fingers should apply pressure, squeezing gently, while forefinger steadies nozzle.  
Shell Progress Photo

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**GENTLE BLASTING** (below) removes heavy concrete walls at San Diego Gas & Electric substations without damaging valuable electrical equipment. Walls were 10 ft. high, 3 ft. wide at base and tapered to 1-ft. width at top. Down holes were drilled on 4-ft. centers along top to depth of 9 ft. In order to direct force of blast away from substation, holes were drilled on 2-in. batter toward outside edge. Three light charges of dynamite were placed at bottom, one-third and two-thirds points of each hole. Blasting cracked wall and broken blocks were easily removed by crane. Operations were directed by George F. Pythian, superintendent of special construction for company.



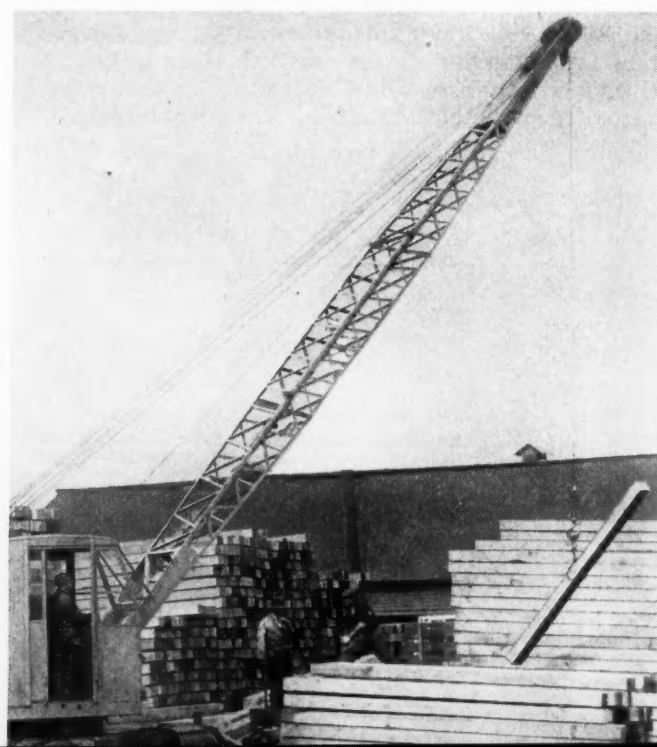
# HOW

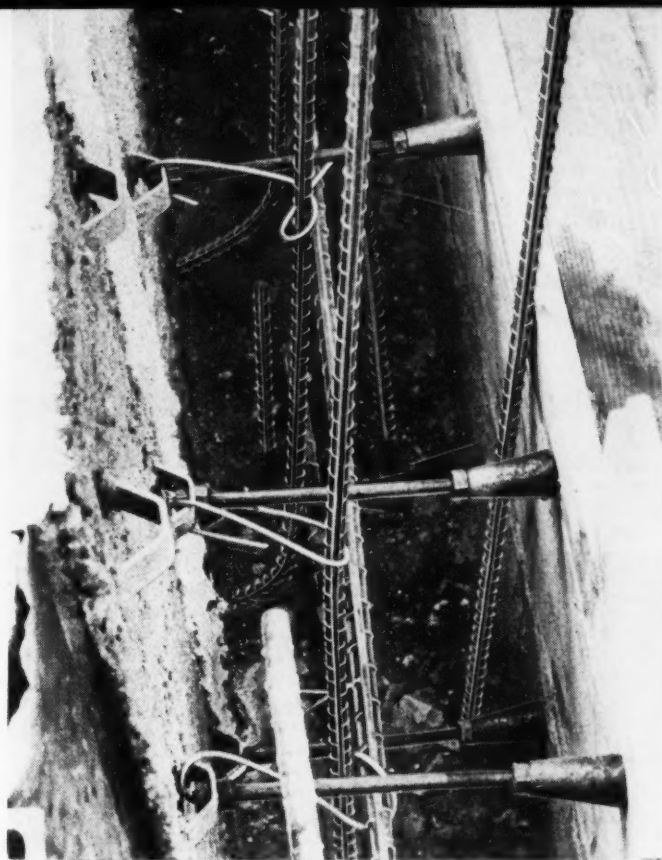
## *They Did It*

### CONSTRUCTION DETAILS

#### *For Superintendents and Foremen*

**TIMBER TONGS** (below) on load line of Koehring one-man cruiser crane handle heavy pieces for Lord & Bushnell Lumber Co. at its Chicago yard. Crane sorts lumber according to length and size for rehandling by straddle trucks which deliver timbers to desired location, where motor crane again stacks material for temporary storage until needed.





**PRECAST CONCRETE ARCHITECTURAL SLABS** for facing Mormon Temple at Idaho Falls, Idaho, serve as outside form for cast-in-place concrete walls. Slabs are set in typical masonry fashion and are held in position by  $\frac{3}{8}$ -in. spreader bolts fastened to inside wooden forms. On slab side, bolts engage heavy strap loops attached to mesh reinforcement. Contractor is Bird Finlayson, of Pocatello. Slabs were set by Thomas B. Child, of Salt Lake City.



**SPECIAL ROCK-RAKE ATTACHMENT** on D-7 Caterpillar tractor removes 8-ton boulder in land clearing. Boulder, which protruded only 6 in. above ground when job started, took 4 min. to extract. Special rake was invented by South Shore Contracting & Dredging Co., Patchogue, L. I.



**REINFORCING STEEL** is tied in place by wire from reel attached to workers' belts in Olmsted Siphon of Provo Reservoir Canal in Utah.



**SPREADER BOX** is adapted to discharge material into widening strip in Ohio's highway improvement program.

→  
**NINE DIAPHRAGMS** of 12-gage galvanized corrugated iron are placed around triple 72-in. Armco culvert in Mississippi River levee near Fort Chartres, Ill., to prevent seepage alongside pipes. Diaphragms in two sections with lower half set first to receive pipe, are spaced about 20 ft. apart. After pipe is lowered, upper half of diaphragm is secured with bolts through slotted holes, forming section 13 ft. square, chamfered at corners to reduce weight. Joseph L. Pohl, of Nevada, Mo., was contractor.



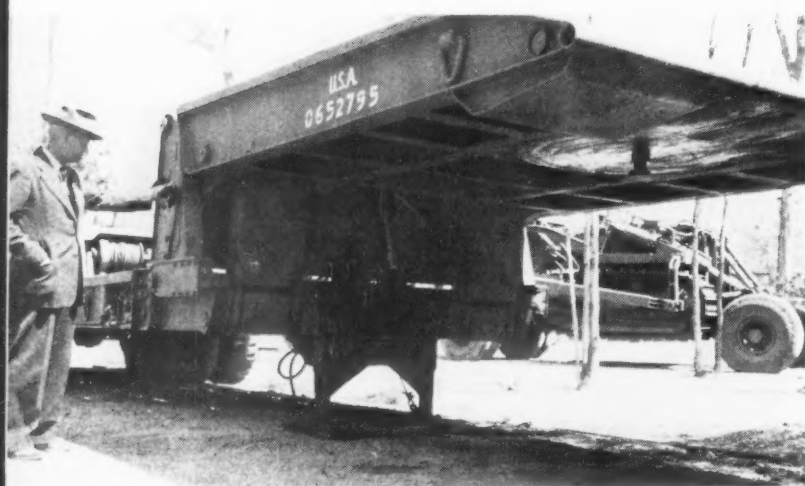


# War Equipment

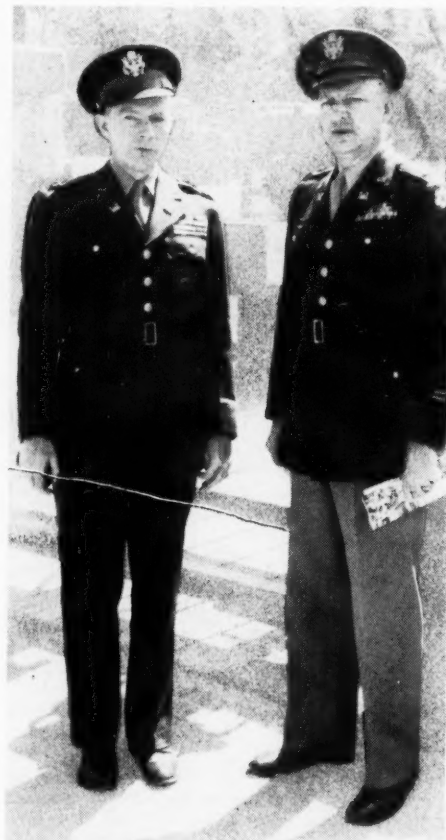
EXHIBIT INCLUDES AMERICAN AND CAPTURED GERMAN, JAPANESE AND ITALIAN UN



U. S. ARMY ENGINEER EQUIPMENT used in war theaters overseas, together with its counterpart in captured enemy materiel of German and Japanese manufacture, was placed on exhibition April 16 at Fort Belvoir, Va., by the Engineer Board, of which Col. James C. Marshall is president and Col. William A. Carter, executive officer, and the Publication Board of the Department of Commerce, established by the President to distribute information to American science and industry. More than 200 separate items were on display. The accompanying photographs illustrate those units adapted to peacetime use by construction men and civil engineers.



**SELF - POWERED TRAILER** (above) with hydraulically operated ramp extension on front end (left) is designed for heavy off-road duty. Two 76-hp. gasoline engines on rear end drive all wheels through roller chains and operate hydraulic pump to raise ramp. Trailer built has rated pay load capacity of 20 tons and is equipped with 25,000-lb.-capacity winch for pulling load up ramp.

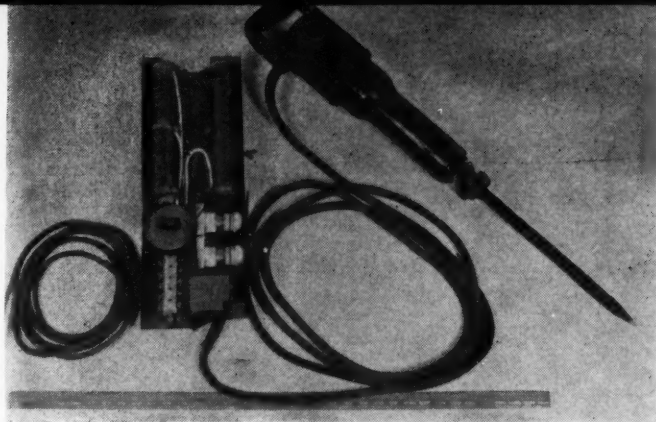


HEADING ARMY'S ENGINEER BOARD are COL. JAMES C. MARSHALL (right) president, and COL. WILLIAM A. CARTER, executive officer.

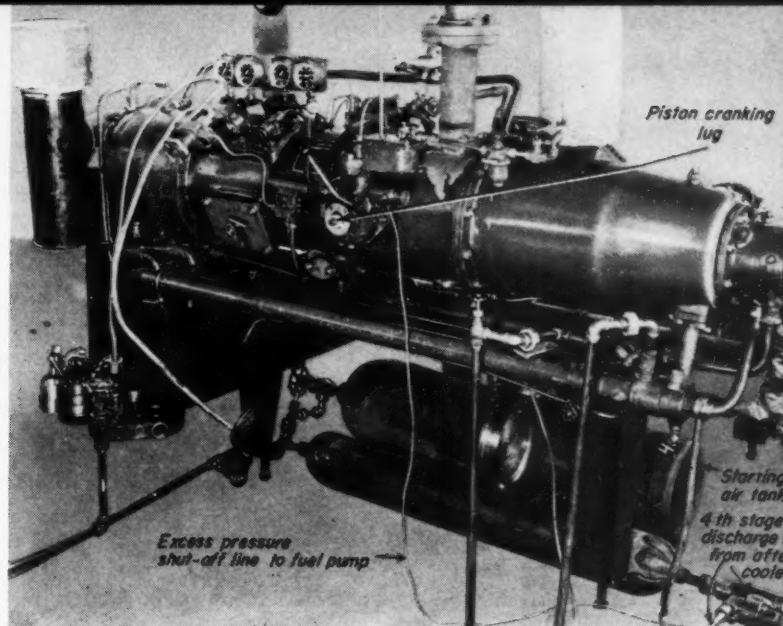


**BLAST-DRIVEN ROD** (left) is new tool for putting down holes in clay and gravel soils. Detonation of explosive in chamber at top of rod drives it into ground for full length. Removal of driven rod is accomplished by use of lever device shown below. Driven rod forms 1-1½-in.-dia. hole 6 ft. deep which is then enlarged to 12-in. dia. by multiple strands of blasting cord or by springing charge of Pentolite, standard Army explosive.

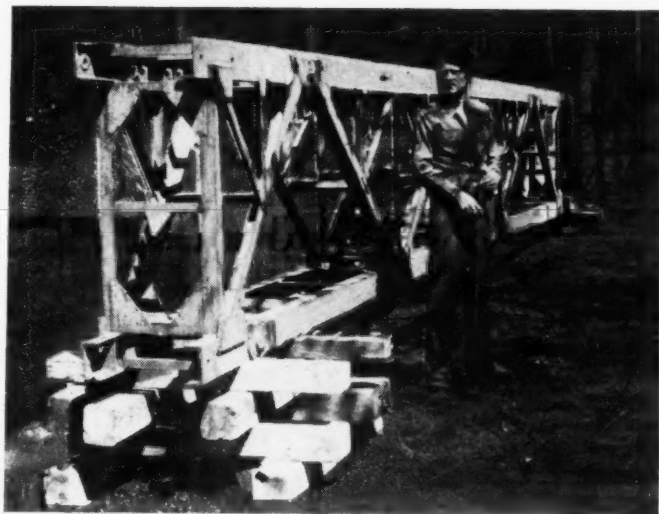




**GERMAN ELECTRIC DRILL** is designed to transform rotating motion of motor into reciprocating motion without excess shock to motor.



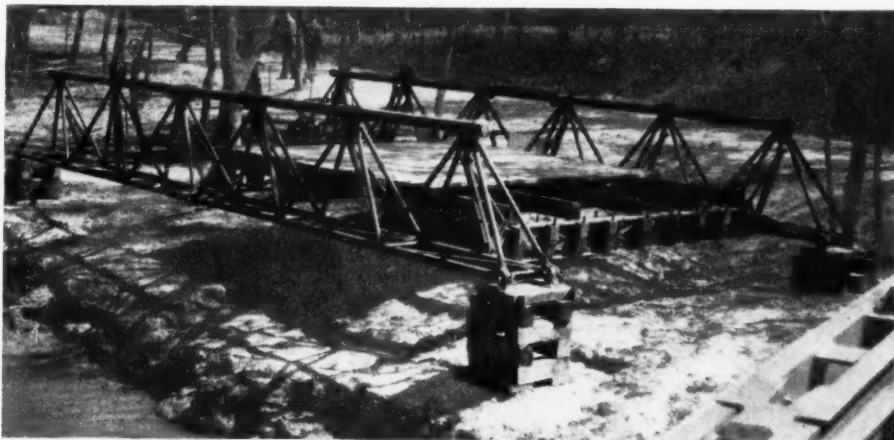
**CONVENTIONAL CRANK SHAFT** and connecting rod are eliminated in this free-piston air compressor captured from Japanese. Single combustion chamber in center of compact cylindrical housing drives two opposing pistons simultaneously outward. Combination of engine and compressor in one unit makes for simplicity and minimizes vibration. Compressor delivers 3,000 cu. ft. of air per min. at pressure of 300 psi.



**STEEL UPPER TRUSS** of Japanese railway bridge is designed for spans up to 105 ft. Lower truss of simple Warren type is combined with upper member to form double Warren truss. This bridge is heaviest capacity Japanese railroad bridge of portable type.



**DEEP WELL PUMP** of helical rotor type is driven by gasoline engine through right angle gear head. Positive displacement unit is chromium-plated stainless-steel rotor which turns inside molded rubber stator. Capacity, from 60 gpm. against a 250-ft. head to 40 gpm. against an 800-ft. head.



**ITALIAN TUBULAR BRIDGE** is designed for assembling and launching from one abutment.

**FRENCH SNOW PLOW** (below) is large, powerful machine but is claimed to be too complicated for easy operation. Discharge tubes are not set in line with rotor blade, causing snow to stick in tubes.



**GERMAN 10-TON CRANE** (below) on crawler-mounted three-quarter track vehicle is of revolving type and is equipped with variable counterweight and boom along which counterweight may be extended to increase lifting capacity of load boom. Load boom is of three 8-ft. sections of heavy-weight tubing.





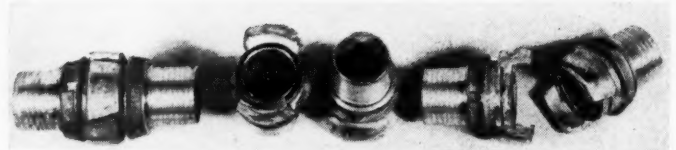


**FLOODLIGHT SET** to increase efficiency on construction work at night has aluminum tripod with telescopic legs which supports three 1,000-watt floodlights 25 ft. above ground.

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## War Equipment

(Continued)



**ALUMINUM ALLOY HOSE COUPLING** of German design is quick acting and comprises two identical halves. Coupling is accomplished by mating two halves and turning two coupling rings one-quarter turn. No wrench is required.

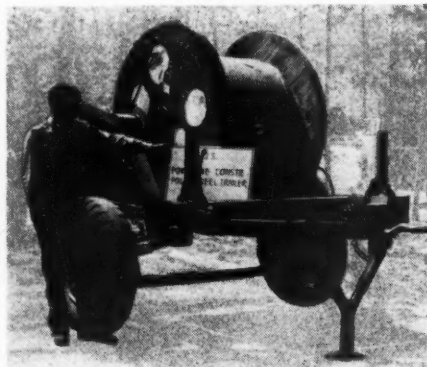


**GERMAN CHAIN SAW** is operated by single cylinder 2-cycle engine. Unit weighs 107 lb. and is equipped with centrifugal clutch. Each saw is provided with a gasoline-powered chain sharpener driven through a flexible shaft.

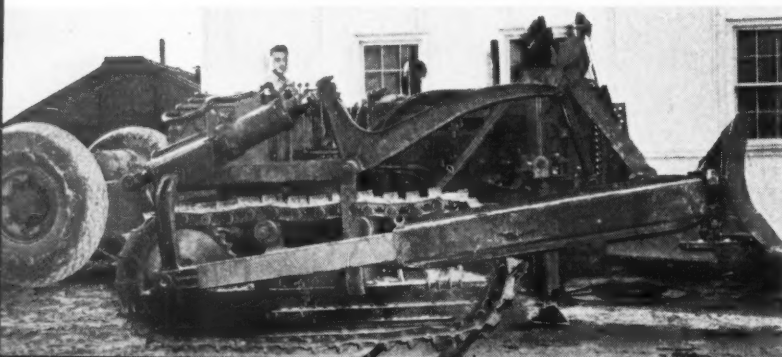


**ALUMINUM DECK** supported by aluminum pontoons spaced on 15-ft. centers is feature of latest type of U. S. Army floating bridge. Normal bridge of this type has capacity of 55 tons (tank loading) in river currents up to 7 ft. per sec. Bridge can be strengthened to carry tanks weighing 80 tons.

**CABLE REEL TRAILER** is designed for power-line construction. Reel is loaded by tipping trailer to engage spindle of reel and then righting trailer with aid of truck winch.



**RAPID MOVEMENT** of tractor-bulldozer (below) from one site of operation to another is insured by fitting rear end with pneumatic tires and front end with a fifth wheel to permit machine to be hauled rapidly as trailer load. Rear pneumatic-tired wheels are raised and lowered hydraulically through pair of pistons.



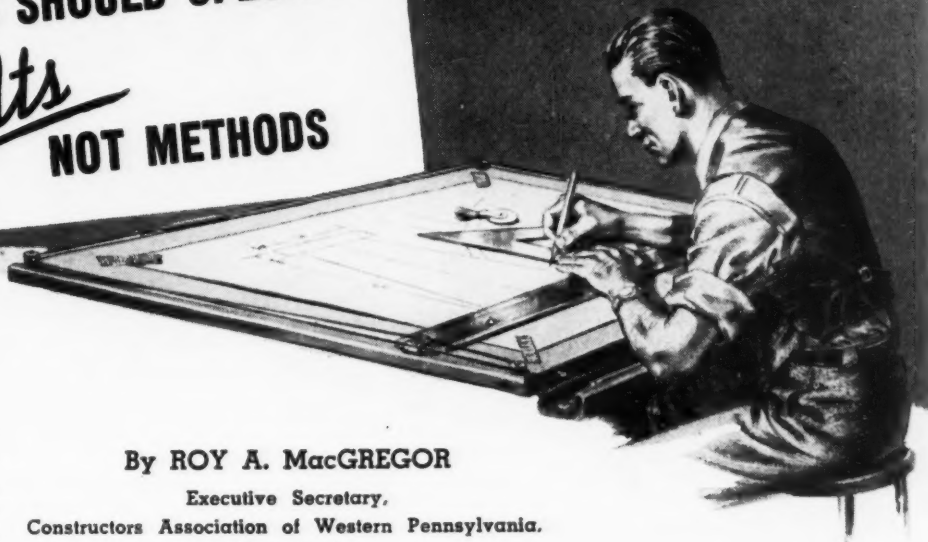
**TANK-MOUNTED SCISSORS BRIDGE** (below) developed by Engineer Board facilitates crossing of tank ditches and canals under fire. Bridge is carried, folded, on top of tank. and is launched by turning valves within tank. This bridge with 42-ft. span will carry a 35-ton tank. After all tanks in unit have crossed ditch, bridge-launching vehicle crosses over, picks up bridge and moves on.



## ENGINEERS SHOULD SPECIFY

*Results*

NOT METHODS



*These notes are condensed from an address delivered by Roy A. MacGregor before a meeting of secretary-managers during the 1946 convention of the Associated General Contractors of America in Chicago.*

By ROY A. MacGREGOR

Executive Secretary,

Constructors Association of Western Pennsylvania,  
Pittsburgh, Pa.

THERE HAS BEEN a growing tendency during the last decade for plans and specifications to depart from the original intent of defining what is to be built, and to include methods and practices to be used in building the structure. This practice robs the reliable, skilled contractor of his initiative and ingenuity in doing his work, and it encroaches on the prerogatives which are rightly his in his business.

Specifications that prescribe methods of construction to be followed are an encouragement to firms not familiar with the work to enter the field. In many instances they influence unskilled and even unreliable contractors to file unintelligent bids which demoralize the market for reliable firms who know their business. A contractor can be required to drive a specified nail into a specified place, to a specified penetration, by a specified time. How he drives that nail, what he uses to drive the nail with, and when he drives it, are his business and his business alone. If he wants to drive it with a tack hammer or a claw hammer, a ball-peen hammer or a sledge hammer, that should not be the concern of him who has given the contractor the job. It is this attempt to tell the contractor how, with what, and when that is making our specifications today confusing, ambiguous, unreasonable, impractical and often unfair. Then again, after a contractor has gone through page

after page to find out just what he is supposed to deliver, he finds such words as "approved by," "to the satisfaction of," "acceptable to," "as directed," "prescribed," and "by the Engineer," which indicate that, after all, the contractor really cannot know until the time of doing the work just what he will be required to do.

### Specifications Too Bulky

The other day I was looking over a set of specifications used in 1936; they then contained 310 pages. The same specifications 5 years later contained 440 pages, an increase of 42 percent, and I feel sure that the quality of work furnished in the later year was no better than that furnished earlier. In fact, one of the best jobs of this type ever built in our area, as shown by its condition today, was built in 1925 and is still in better shape than jobs built 10 years later.

Specifications develop like laws. Some unlooked-for thing happens and, although it may never or seldom happen again, a specification must be written to cover it. An unprincipled contractor puts over some slick trick, and right away a hundred self-respecting, reliable contractors must be hog-tied because of him. It would be better to burn the offender with close inspection and make him sick of the business, than to write another section, paragraph, or clause to the specifications.

A number of years ago an argument developed among an inspector and his engineer, a contractor and a ready-mixed concrete company which was furnishing concrete to the contractor. The engineer who wrote the specifications turned them over to the chief engineer, who in turn had given them to the chief construction engineer, who had sent them to the district engineer, who gave them to the field engineer, who told the job engineer to tell the inspector what they meant. None of them knew what the specifying engineer had intended in the first place. When he learned what was happening, he settled the dispute promptly by long-distance phone. In this instance the trouble originated in the fact that the specifications tried to tell everyone how to mix good concrete in a truckmixer rather than to tell the kind of concrete wanted. Like gossip, misinterpretation grew with each repetition.

### Wasteful Practices

Recently a specification required 1-in. lumber for the lining of wall forms. An inspector insisted that 1-in. commercial lumber was not 1-in. lumber. He demanded that 1¼-in. lumber be bought and surfaced to 1-in. Again, specifications for columns limited concrete pours to 3 ft. of column. The contractor was forced to accept 2-yd. batches of ready-mixed concrete on a 20-

(Continued on page 158)





LARGE TURNOUT of 65 operating engineers attends first session of wellpoint training course put on at request of union's business representative in Hammond, Ind. plant of Griffin Equipment Co., Inc. All these men are actively employed members of Local 150, except for four numbered individuals in back row: (1) TIMOTHY J. GRIFFIN, president, Griffin Wellpoint Corp.; (2) WILLIAM J. LAW, business representative, Local 150; (3) HARRY J. HUSH, lecturer, vice-president of Griffin Wellpoint Corp.; and (4) NEILL N. PAYNE, manager, Griffin Equipment Co., Inc.

## *Labor Union Promotes Wellpoint Training Course*

COOPERATIVE ACTION by the business representative for Local No. 150, International Union of Operating Engineers, Hammond, Ind., convinced the Griffin Equipment Co., Inc., in the same city, midwest branch of the Griffin Wellpoint Corp., that the union was genuinely interested in having the manufacturer put on a training course to improve the knowledge and efficiency of its members as operators of Wellpoint systems. Soil and topographic conditions in the Hammond area favor increas-

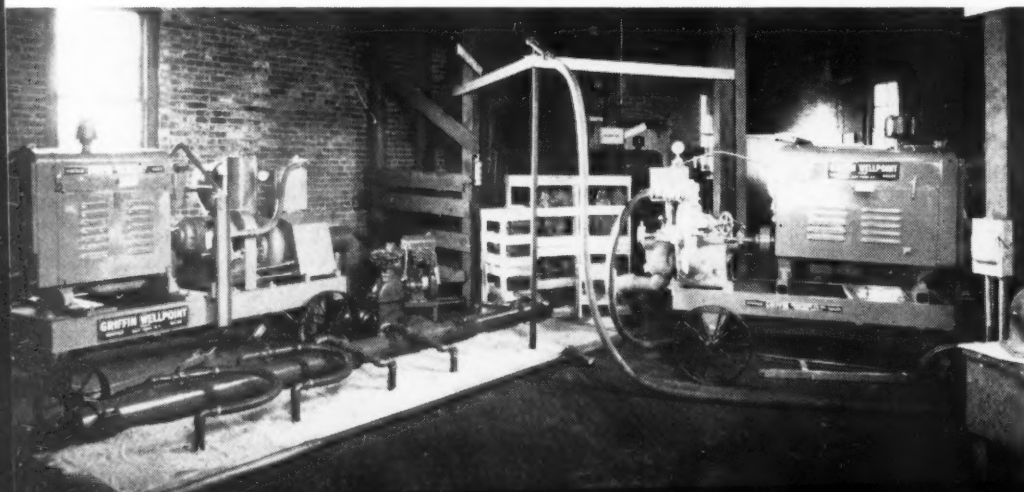
ing use of wellpoints to dewater foundation jobs for the industrial expansion in that vicinity, and William L. Law, business representative for the local union, saw an opportunity to augment the value of the engineers as members of the contractors' teams.

Accompanying photographs show the results of Mr. Law's initiative. Neill N. Payne, manager of the Griffin Equipment Co., Inc., arranged a course to be given in four well-spaced evening sessions starting Feb. 1, at the Hammond plant.

Harry J. Hush, vice-president of Griffin Wellpoint Corp., came on from New York to deliver a lecture at each meeting. An average of 65 attended each class.

Eight days before the first meeting Mr. Law addressed a letter to the members of the union, outlining the purpose of the course as follows: "This lecture will be one of a series of instruction to engineers of Local No. 150 of the International Union of Operating Engineers in order that they may benefit, as well as the contractors of this area, to the extent that they shall make better progress on all dewatering systems installed by contractors in this territory.

"There shall be a complete breakdown of pump and wellpoint systems in their various classes of operation. Questions may be asked and answers will be given to all who may seek information in regard to their pumping systems."

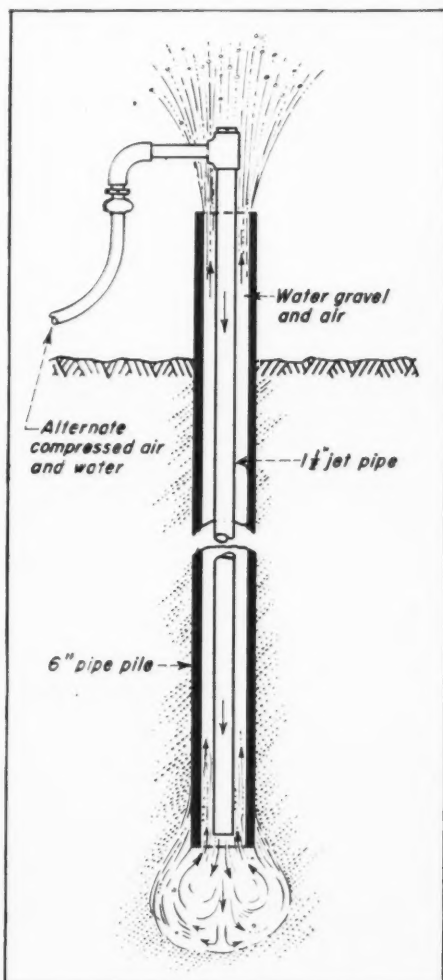


WELLPOINT DISPLAY set up in shop where lectures are given demonstrates installation and operation of wellpoint systems, including jetting of points. At right is two-stage jet pump. One point is set vertically, supported by two wooden horizontal pieces, and partially jetted in place. On floor is another wellpoint ready to be installed, with half of swing joint attached to riser. Wellpoint pump at left is connected to header line by T and 6-in. gate valve.

# Pipe Piles Jetted For Tower Supports

STEEL PIPE PILES, jetted by water and compressed air, were used to reinforce a transmission line support in danger of being undermined by river bank erosion. When meandering of the South Platte River undercut one of the woodpole H-frame supports of the Greeley-Fort Morgan transmission line of the Colorado-Big Thompson project, the U. S. Bureau of Reclamation erected a new structure de-

PILE JETTING (below) is by alternate use of water and compressed air forced through inner jet pipe. Excavated material is carried upwards through inside of pile.



AIR BLAST clears pipe pile of accumulated material during jetting. Alternate air and water jetting are necessary to sink pipe through ground containing 4-in. gravel. Note hold-down weights on pile to aid sinking.



CONCRETE-FILLED PIPE PILES are banded to pole to furnish permanent support for transmission line frame erected on low ground subject to erosion. Top clamp is welded to pipe and bolted through pole.

signed to remain stable even if the river channel should move around it.

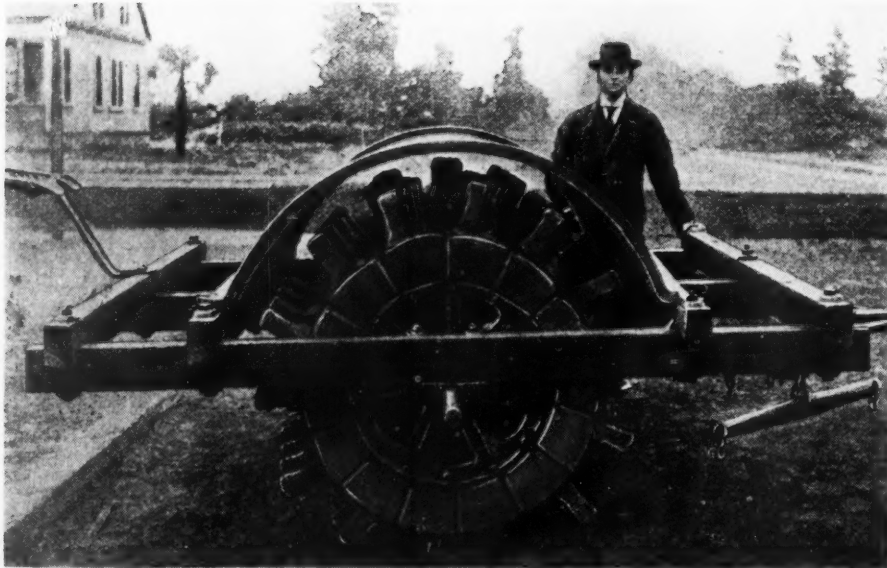
Supports for the transmission line are two 60-ft. poles with 20-in. butts set 8 ft. below ground line. In 1942, two years after the line was built, the supporting frame at the South Platte River crossing near Greeley, Colo., started to tilt due to bank erosion. A wood pile was driven at each leg to give additional support, but continuous erosion again endangered this frame and it was replaced with a more permanent structure. A new supporting frame, similar to the original, was erected 100 ft. back from the river bank, and each leg was reinforced with three 6-in. standard steel pipe piles extending to solid foundation.

Each pile was started in a 3-ft. hole and six 100-lb. hold-down weights were affixed to assist sinking. A 1 1/2-in. jet pipe, placed inside the pile, was connected through a hose and tee to a LeRoi 210-cu. ft. per min. air compressor and a Fairbanks-Morse reciprocating pump rated 5,000 gph. at 100-lb. pressure. Water jetting at 100 psi. sank the pile about 10 ft. through sand and small gravel. Below the 10-ft. depth, the flow of water from the jet was insufficient to raise the 1 1/2 to 3-in. size gravel encountered, and short jets of air at 100 psi. were necessary to clear the pile of accumulated material. Alternate air and water jetting sank the pipe pile to solid foundation 22 ft. below pole butt and 30 ft. below ground surface. After the

(Continued on page 159)

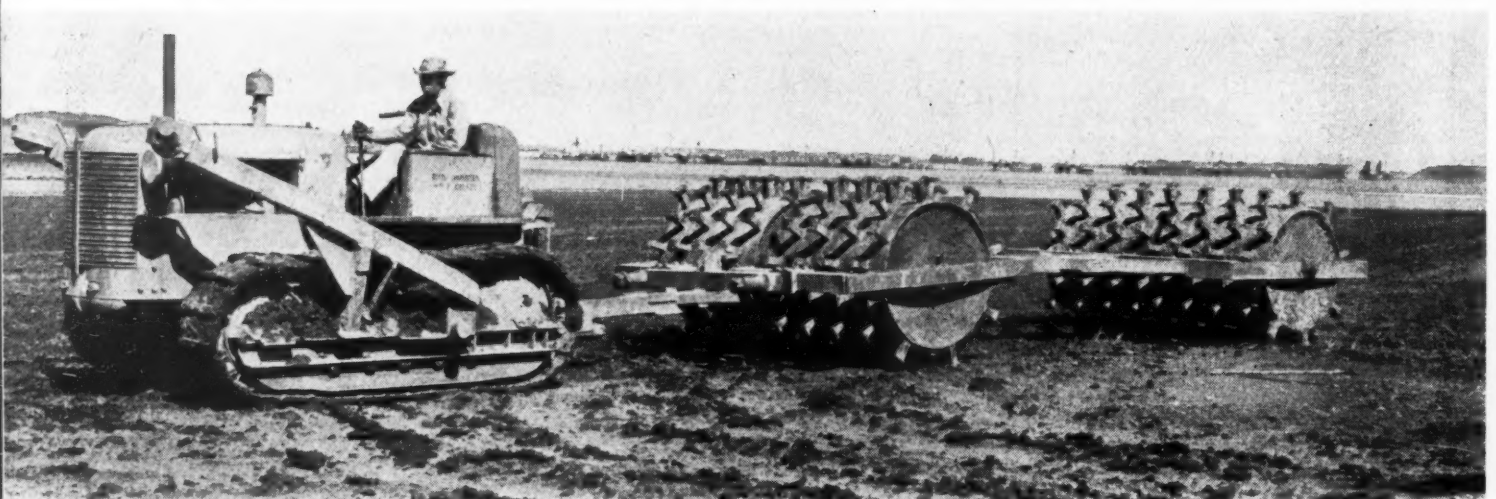


# Heavy Rollers for Soil Compaction

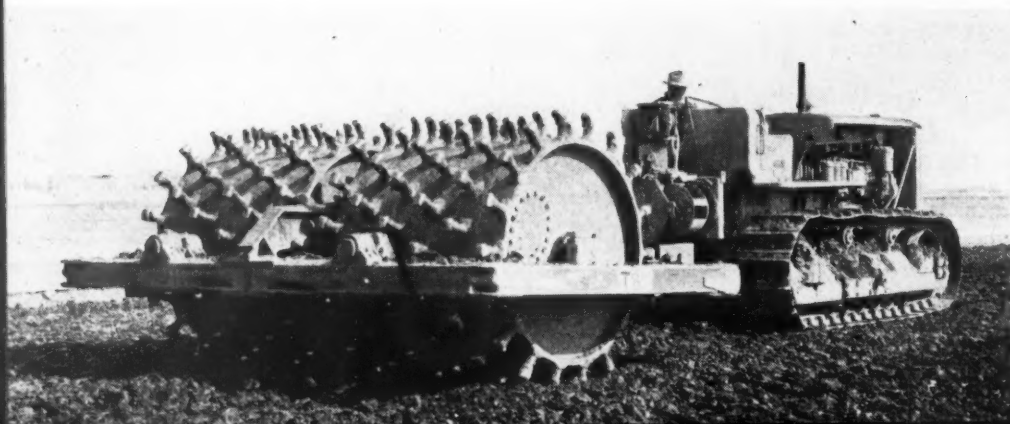


**FORERUNNER OF MODERN SHEEPSFOOT** rollers is this horse-drawn Fitzgerald roller developed and used in 1904. Unit weighs 5,000 to 6,000 lb. and gives a footprint pressure of 40 to 50 psi.

**HIGH DEGREE COMPACTION** of subgrade and base required in modern highway and airport construction has resulted in the development of monster sheepsfoot and pneumatic-tired rollers. Heavier equipment permits an increase in the thickness of the rolled layer, and effects a higher degree of compaction, which results in decreased construction costs. Tests made by the Los Angeles District, U. S. Engineers, at Clover Field, Calif., showed that a rubber-tired roller loaded to 60 tons had about twice the efficiency in compacting 6-in. layers of sandy loam as the same roller when loaded to only 40 tons.



**LIGHT STANDARD SHEEPSFOOT** compacting airfield subgrade weighs 8,000 to 16,000 lb. per 8-ft. width of 42-in.-dia. drum, and gives foot pressures from 100 to 300 psi. Modern rollers have selection of removable feet and drum may be ballasted.



**HEAVY STANDARD SHEEPSFOOT** weighs 35,000 lb. per 8-ft. width of 42-in. dia. drum when ballasted with water and sand. Print pressure of 600 psi. may be increased to 740 psi. by loading drum with 18 percent water slurry of baroid.

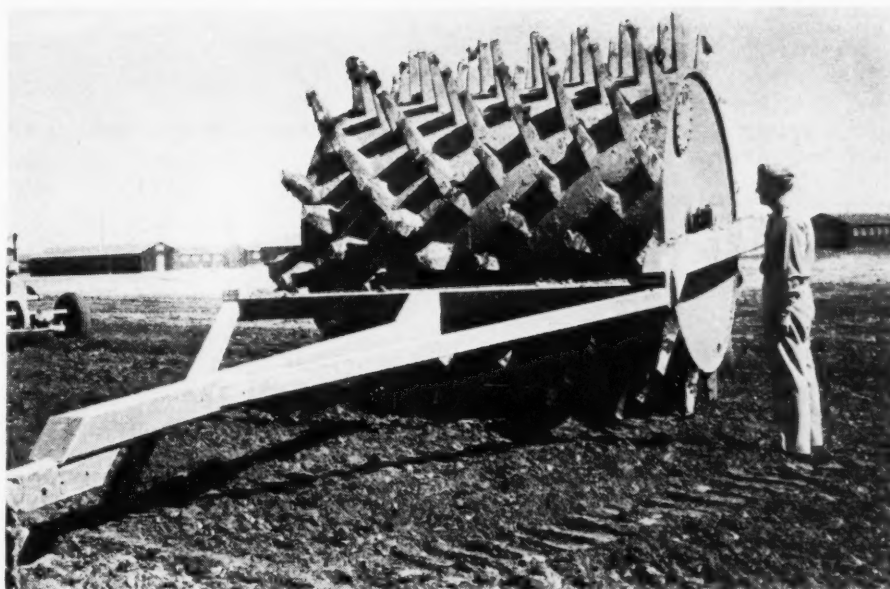
• Because soil compaction is an integral part of modern earthmoving, every engineer and contractor concerned with earthwork projects is interested in the trend of equipment for compaction. An excellent paper on this subject was given at the 1946 annual meeting of the American Road Builders Association in Chicago by O. J.

Porter, staff materials and research engineer, California Division of Highways, and consultant on airport construction for the Corps of Engineers. Herewith is a summary of his remarks and a reproduction of some of his pictures illustrating the development of both sheepfoot and pneumatic-tire types of heavy rollers.

In general, the energy required for compacting relatively impervious soils varies roughly as the square of the layer thickness.

Sandy soils are more readily compacted than are heavy cohesive soils which must be spread in thin layers to facilitate the escape of entrapped air when the material is rolled. Correct control of moisture to lubricate the soil particles is necessary for efficient consolidation, but where the addition of water may be uneconomical or impractical, as in desert regions, sandy soils can be compacted dry in thin layers.

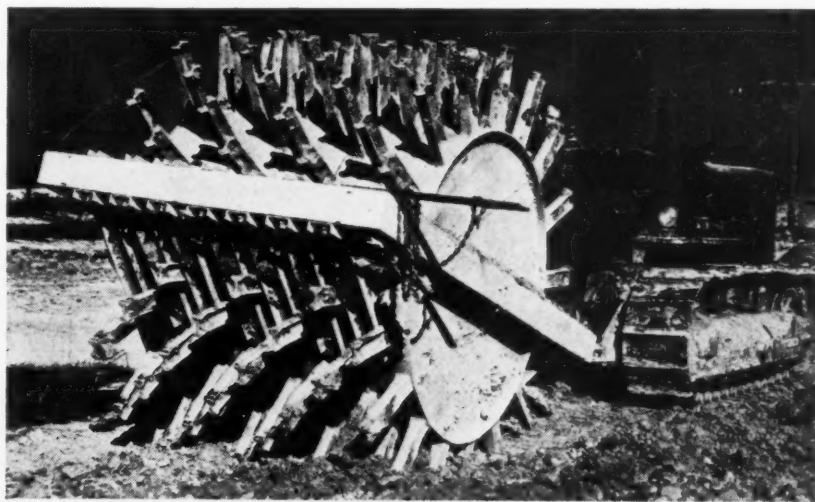
Sheepsfoot rollers have developed from the 6,000-lb. Fitzgerald tamp-



**GIANT SHEEPSFOOT** is used to compact material subsoil below subgrade without removing and replacing material. Legs 18 in. long are mounted on 8-ft. dia. drum, 10 ft. wide. Unit weighs 30,000 lb. empty and 75,000 lb. filled with sand and water, and can compact efficiently to depths of 12 to 24 in. with footprint pressures varying from 400 to 1,000 psi.

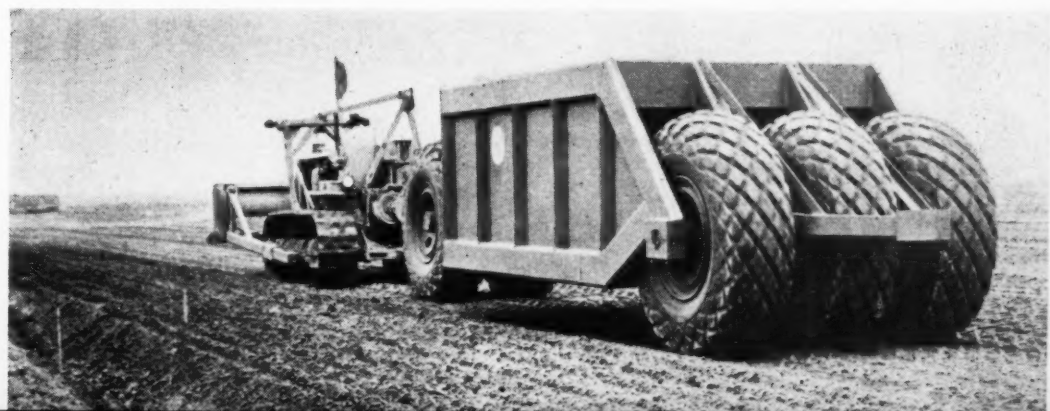


**RUBBER-TIRED ROLLER**, loaded with rail to 75 tons, completes airport subgrade compaction following sheepsfoot rolling, and will consolidate base course layers subsequently placed. With spreader girder bolted between two halves of unit, roller may be used to test completed pavements.



**EXPERIMENTAL OVERSIZE ROLLER** being tested by Waterways Experiment Station, Vicksburg, Miss., exerts pressure of 1,080 psi. when ballasted with baroid slurry.

**ROLLER WAGON** mounted on five tires and drawn by Caterpillar D-8 tractor compacts subgrade at Clover Field, Calif. Superior compaction, averaging approximately 100 percent of modified AASHO density, was obtained on this project by spreading material in 3 to 6-in. layers and loading roller to 60 to 100 tons.







TRICYCLE ROLLER is hauled by Euclid wheeled tractor. Loaded with steel ingots to 120 tons, roller compacts subgrade of Suisun-Fairfield Army Airbase.

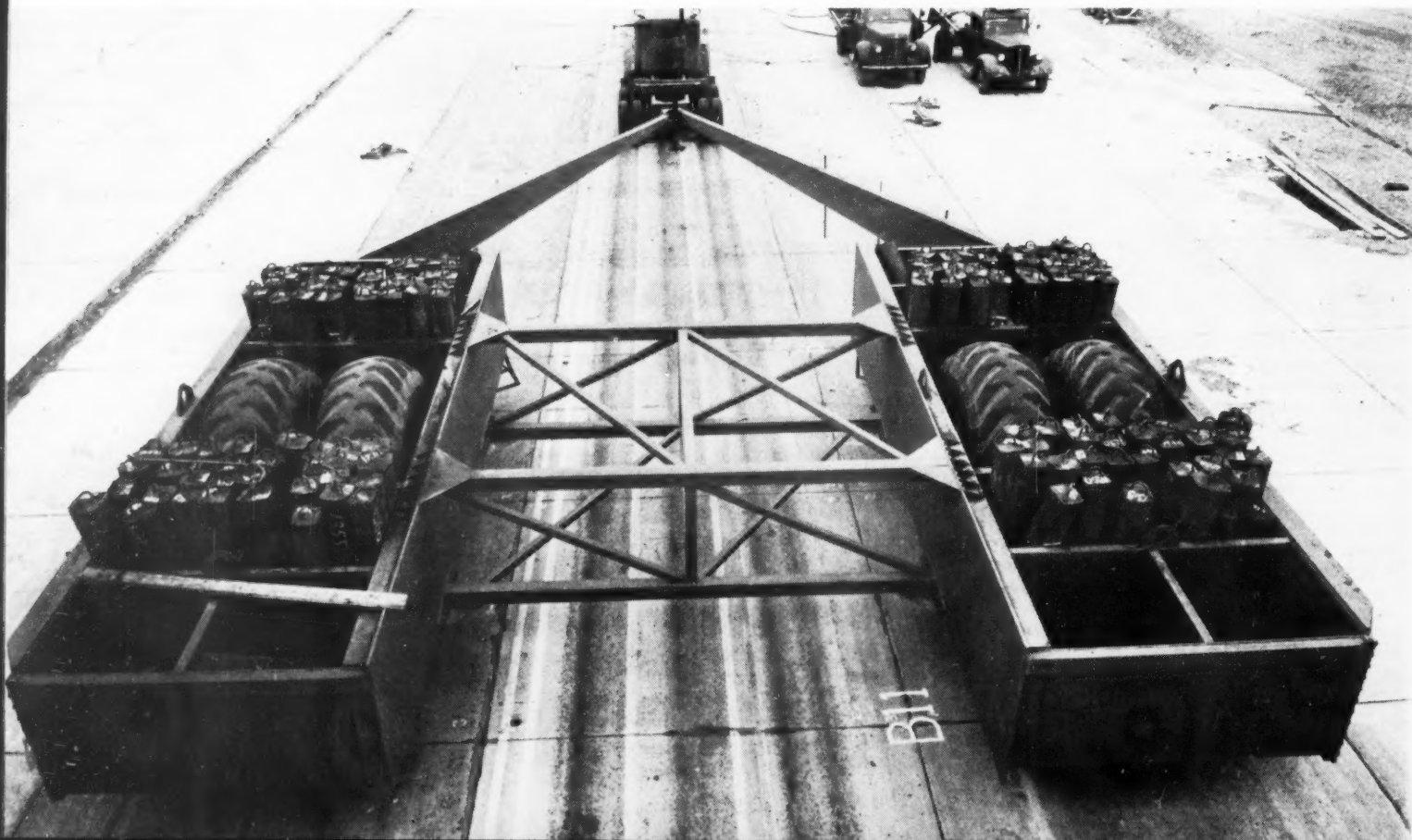


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TIRE REPAIR on gigantic present-day equipment is no easy job. Truck-crane holds a 36x40-in. tire from a 150-ton roller.

ing-type roller introduced in 1904, and having a footprint pressure of about 50 psi., to modern giants with weights up to 75,000 lb. developing pressures of 1,000 psi. under their feet. Many fills have been compacted in thin layers by rolling them with heavily loaded, rubber-tired, tractor-drawn scrapers. High embankments compacted by this method in California in 1929, have not settled sufficiently to require resurfacing. Present pneumatic-tired rollers may be loaded up to 200 tons on four tires, and rollers with variable-spread wheels are used to duplicate plane loadings for tests of completed airport pavement.

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AIRPORT PAVEMENT (below) is tested under gross load of 140 tons by roller with tires spread to duplicate wheel spacing of heavy airplane. With spreader frame removed and load boxes bolted together, unit is used for soil compaction.



# LEGAL ADVENTURES

of TRACTOR CONN

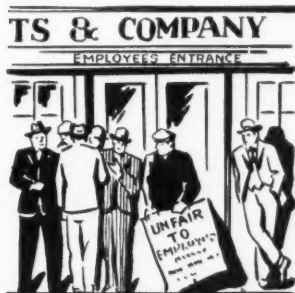


By LESLIE JOBB

No contractor ever tries to be his own dentist or his own shoemaker. It is even more dangerous for him to be his own lawyer. There are, however, some legal rules which every contractor should know, and these rules may be explained in plain English without resorting to the jargon of the law, unintelligible to most laymen.

This series of articles, dealing with the Legal Adventures of Tractor Conn, a typical contractor anywhere in the United States, explains some of these legal points in plain language for the contractor. Each one is based on an actual decision of an American Court.

## The Case of the "Specific Performance"



Tractor Conn had agreed to erect a Massachusetts building and a manufacturer agreed with Conn to manufacture and install the elevator inclosures and doors. These inclosures and doors were made according to the architect's plans and were manufactured for that particular building.

Tractor Conn went on with his work, the manufacturer began installing the inclosures and doors, and a "grievance committee" from the Iron Workers Union threatened to strike, as they objected to the workmen employed by the manufacturer.

"I'll carry on with carpenters," the manufacturer suggested.

"Nothing doing," Conn told him and the manufacturer ceased work.

"My contract gives me the right to change the terms of the agreement, so I'll hire workmen and do the installing myself," Conn proposed. The manufacturer

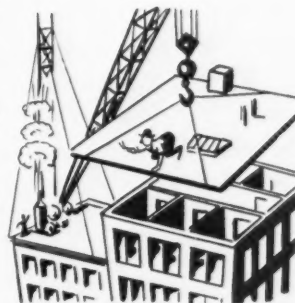
sued in the Massachusetts court to compel Tractor Conn to allow the manufacturer's carpenters to do the installing, while Conn in the same suit demanded that the manufacturer be compelled to furnish the balance of the work according to the contract.

"That would be 'specific performance', which is not allowed on an ordinary sale of personal property," the manufacturer pointed out.

"This is not an ordinary sale. These materials were made to order, and cannot be bought in the open market, and damages would not be an adequate compensation," Tractor Conn's lawyer contended, and the Massachusetts Supreme Court ruled in his favor in the case of *Dalstrom vs Evatt*, 152 N.E. 715.

## The Case of the Contractor's Lien

"That the said Tractor Conn will not at any time suffer or permit any lien, attachment or other incumbrance by any person or persons, whomsoever to be put or remain on the building or premises, into or upon which any work is done or materials are furnished under this contract, for such work or materials or by reason of any other claim



or demand against the party of the second part, and that he will not put any materials on said building to which he has not obtained absolute title; and that any such lien, attachment or other incumbrance, or claim of a third party until it is removed, shall preclude any and all claim or demand for any payment whatever under or by virtue of this contract," Conn's contract provided. Conn began work, the owner failed to make the agreed monthly payments, and Conn promptly filed a lien on the building.

"But you agreed not to permit a lien on the building," the owner pointed out.

"Your failure to live up to your contract relieves me from my agreement not to file a lien," Conn averred, and the New York Court of Appeals ruled in his favor in 205 N.Y. 522.

"There are many reasons why an owner might wish to be free from the claims of subcontractors and materialmen against the principal contractor which might involve him in expensive litigation and the possibility of loss. Those reasons are without force when applied to a lien filed by the principal contractor," the New York Court ruled.

**More Legal Adventures of  
Tractor Conn Next Month**



Congress has acted—and along these lines—since this editorial was written. If the President signs the legislation, we have taken one step forward. If he vetoes it, the voters must resolve a conflict between two branches of their Government.

# THE LABOR CRISIS

## —it's up to Congress

IT HAS remained for John L. Lewis to demonstrate conclusively that, under the sponsorship of the federal government, the power of organized labor has been built up to a point where it can be used to paralyze the economic life of the nation. Therefore, in the elemental interest of self-preservation, the first order of the day is to cut down the power of organized labor to a point where irresponsible leaders no longer have the power to use it to cut down the country.

This will prove an exceedingly complicated job. The federal government, over a dozen years, has developed and buttressed the power of organized labor by many separate steps. They are interlaced in a pattern which cannot easily be unravelled.

Cutting down the power of organized labor to proper proportions will be an operation almost as delicate as brain surgery. To be successful it must impair no basic American political or economic right. It must leave intact the right of workers to organize and bargain collectively through representatives of their own choosing. It must leave intact the right to strike. But it must disassociate from the exercise of these rights opportunities for devastating abuse of the public welfare such as those demonstrated by Mr. Lewis. A meat axe is not the instrument for this operation.

Because of the complexity and delicacy of the operation to be performed it would be helpful if it could be carried out in a tranquil atmosphere. The urgency of the problem is such, however, that no time can be lost in getting at it.

### Guiding Principles

However, the dangers that haste or heat will lead to serious blunders can be largely eliminated if the process of bringing the power of organized labor back within safe and reasonable bounds is governed by principles to which all fair minded people can fully subscribe.

*The most important of these principles is that it is an abuse of public authority to extend special privileges to organized labor.*

When in 1935 Congress passed the Wagner Labor Relations Act, one of the great buttresses of the power of organized labor, it was upon the explicit theory that organized labor was weak and needed coddling by the federal government if it were to survive, let alone grow big and strong. In the policy

section of that act it was stated that "the inequality of bargaining power between employees who do not possess full freedom of association or actual liberty of contract, and employers who are organized in the corporate or other forms of ownership association substantially burdens and affects the flow of commerce . . ."

Regardless of whether or not that was a correct reflection of the situation in 1935, it bears no relation to the situation today. Under the continuous sponsorship of the federal government, the power and bulk of organized labor has waxed until today it is preposterous to regard it as the weak sister in its bargaining with employers. If, after being continuously demonstrated since V-J Day, the proposition that the pendulum of organized power has swung too far over on the side of organized labor needed any final and clinching demonstration, John L. Lewis provided it.

### Changes in the Law

Translation of the principle that organized labor is no longer a weakling, requiring a diet of special privileges, into specific legislative enactments is a detailed technical operation beyond the scope of this statement. It is possible, however, to indicate some of the general lines it should follow. Here they are:

1. The duty to bargain collectively, now imposed upon employers by the Wagner Act, should also be imposed upon the leaders of organized labor who are now under no legal compulsion to bargain.

For well over a month Mr. Lewis made a complete mockery of the process of collective bargaining by refusing even to state his demands until the coal operators had approved "in principle" a plan for a miners' "health and welfare" fund which he fancied. In the meantime the country was plunged into an ever deepening crisis.

2. Unions, as well as employers, should be made liable to suit for damages for breaking their collective bargaining agreements.

A degree of responsibility commensurate with their age and power requires that unions be liable, to the extent of union funds but not the funds of individual members, for carrying out their agreements. To have it otherwise is to hold that a collective bargaining agreement is, by defi-

nition, a phoney agreement so far as the union is concerned. Outlaw strikes are the fruit of this lop-sided arrangement.

3. Employers should be given more discretion, in reinstating employees who have gone on strike than is now permitted by the Wagner Act.

The Wagner Act largely eliminates the risks involved in striking because of the requirements it imposes upon employers to take workers back when they have decided to return to work. These requirements make it virtually impossible for the employer to replace workers even if they are engaged in the most unjustifiable of strikes. At the least workers who have smashed up property and stirred up violence in the course of a strike should have no rights under the Wagner Act. How much further the Wagner Act strait-jacket should be loosened at this point should be carefully explored, and excesses encouraged by the Act should be removed.

4. The wedge which the National Labor Relations Board has driven into the orderly conduct of American industry by holding that foremen are covered by the Wagner Act should be eliminated.

The issue involved here is continuously mislabelled and confused as that of the right of foremen to organize. There is no question of the right of foremen to organize any kind of a legal organization they desire. That is their right as American citizens. The issue is whether or not the special privileges accorded by the Wagner Act, which in some circumstances has been so construed as even to prevent employers from talking with their workers, should be extended to foremen who, if American industry is to have a chance to do its duty effectively, must represent management with full loyalty and responsibility.

A member of John L. Lewis' United Mine Workers takes an oath which provides, in part, "that I will not reveal to any employer or boss the name of anyone a member of our union" and will "defend on all occasions and to the extent of my ability the members of our organization." Mr. Lewis insists that the coal operators contract to deal with foremen to be organized in a union where they will take that oath, and where their activities will be separated from the influence of employers by the barriers imposed by the Wagner Act. Such an arrangement undercuts orderly management of American industry.

5. The exemption of labor unions from the federal anti-trust laws, provided when organized labor was presumed to be weak, should be modified to take account of its vastly increased strength, and

the use of this strength to destroy business enterprise and create monopoly.

As matters stand unions can run employers completely out of business by secondary boycotts and run fellow workers out of jobs in the process. An Ohio manufacturer, working with a government-certified C. I. O. union, is put out of business because A. F. of L. workers refuse to handle his products. Still the government, this time in the person of the United States Supreme Court, says that actions of this sort are above the law because Congress exempted unions from the federal anti-trust laws.

To eliminate one of the most devastating forms of restraint of trade, this exemption should be cut down forthwith by subjecting unions imposing secondary boycotts to the same penalties under the federal anti-trust laws as those to which employers doing the same thing are subjected. And the question of further narrowing the obsolete exemption of unions from the federal anti-trust laws should be fully explored.

6. The levying of special sales taxes for the exclusive benefit of unions should be prohibited by law.

As a matter of good government the right to levy consumption taxes should be reserved to the public authorities and used strictly for public purposes. As a matter of good economics, payments to workers or their organizations should be included in the payroll where they can be properly counted as part of the cost of production.

### Equality Before the Law

When everything that can conceivably be accomplished by legislation has been accomplished there is no reason to believe that an ideal or even a surely workable system of industrial relations will have been devised. Many of the mainsprings of such a system lie deep in the hearts of men and far beyond the reach of legislation. There is no chance, however, of having such a system, or even a defensible system of democratic government until special privileges which tip the scales of power far on the side of organized labor are withdrawn and there is some measure of equality for employers and organized labor before the law. Though it is hard to believe it at the moment the country may come to be grateful to John L. Lewis for driving that lesson home so ruthlessly.



President, McGraw-Hill Publishing Company, Inc.



## Present and Accounted For...A PAGE OF PERSONALITIES



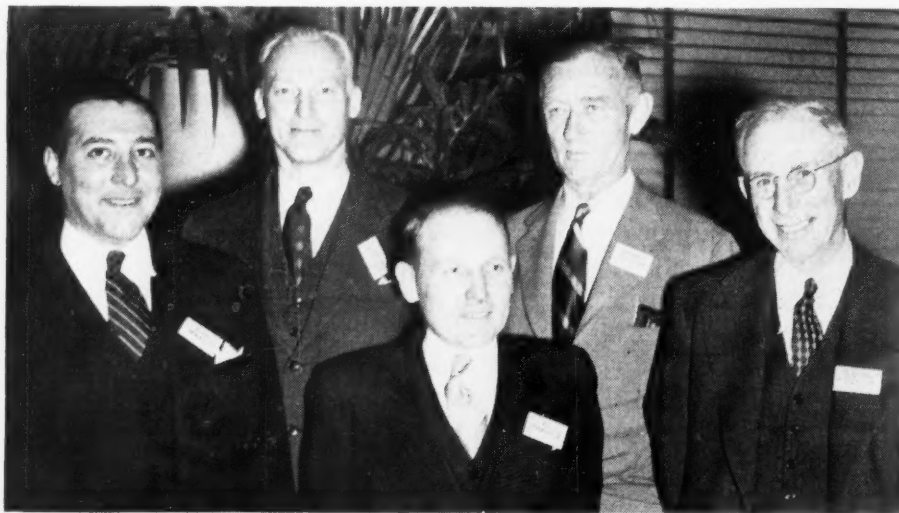
REGIONAL POWER MANAGERS of Bureau of Reclamation meet in Denver to discuss construction program. They are (left to right, standing): B. W. CREIM, Sacramento, Calif.; L. E. MATHEWS, Salt Lake City, Utah; A. C. MacINTYRE, Amarillo, Texas; H. R. LEE, Denver, Colo.; (seated) DAN CAMPBELL, Boise, Idaho; E. R. FOSDICK, assistant director, power utilization, Denver; H. F. McPHAIL, director of power utilization, Denver; and J. R. WALKER, Billings, Mont.



ELECTED PRESIDENT of Associated General Contractors of Massachusetts is ALAN J. POTTER, assistant to president of Aberthaw Co., of Boston. He was general foreman for this company on multi-million dollar project at Portsmouth, N. H., Navy Yard during war.



PRESIDENTIAL GAVEL of American Concrete Pipe Association is handed to ELMER L. JOHNSON (right), of Concrete Conduit Co., Colton, Calif., incoming head, by retiring president O. H. MILLER, of Choctaw, Inc., Memphis, Tenn., at 39th annual meeting in Chicago.



NEW OFFICERS OF THE MOLES, New York organization of tunnel and heavy construction men, were elected at organization's annual business meeting May 1. They are (left to right): WILLIAM W. HANLY, JR. (Koppers Co.), secretary; J. RICH STEERS (J. Rich Steers, Inc.), second vice-president; ALFRED N. WARWICK (Eugene F. Warwick, Inc.), president; CHARLES B. SPENCER (Spencer, White & Prentis, Inc.), first vice-president; RALPH W. ATWATER (Shultz Dredging Corp.), treasurer. Lure of the Kentucky Derby, it is reported, prevented inclusion in this group of Edward J. Mahoney (Mahoney-Clarke, Inc.), sergeant-at-arms.

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THREE NEW VICE-PRESIDENTS have been appointed by The Austin Co., engineers and builders, of Cleveland, Ohio. They are (left to right): HAROLD A. ANDERSON, New York, eastern district manager; CHARLES W. PAYNE, JR., Chicago district manager; and RICHARD ELLIS, Chicago, Pacific Northwest district manager.





*Precisionbuilt* LIKE A FINE GUN  
**J&L WIRE ROPE**  
PERMASET PRE-FORMED

J&L Wire Rope is made with precision by skilled men with the same patient attention to detail, the same insistence upon quality material, as the best hand-made match piece.

J&L Permaset Wire Rope is pre-formed to give it longer life. It hits the target on service. Write for more information.

**J&L  
STEEL**

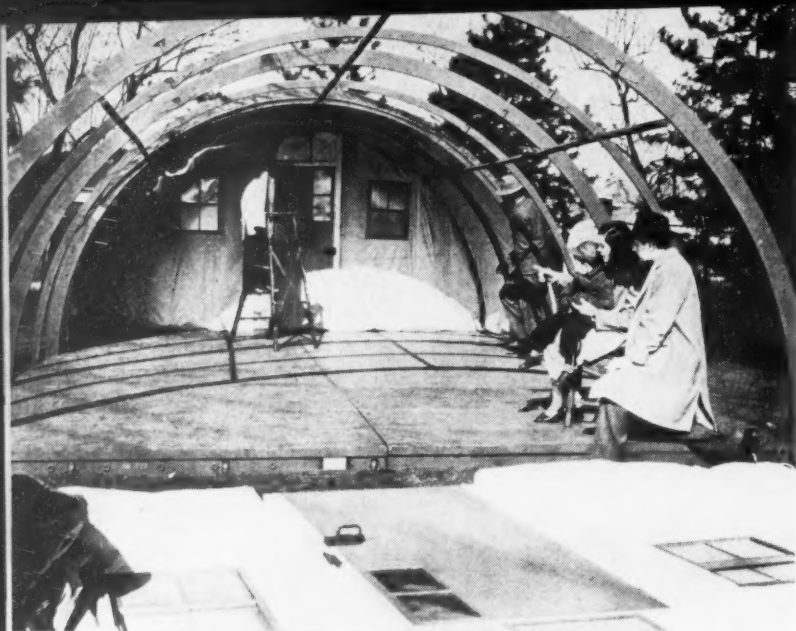
**JONES & LAUGHLIN STEEL CORPORATION**

**GILMORE WIRE ROPE DIVISION**

**PITTSBURGH 30, PENNSYLVANIA**

**J&L** *Precisionbuilt* **PERMASET PRE-FORMED WIRE ROPE**





**GLASS BLANKETS** are placed over aluminum framework to make portable shelter which can be erected in 2 hours by four men. Manufactured by James Mfg. Co., of Janesville, Wis., 16x24-ft. dwelling will sell for less than \$1,000. Walls and roof consist of blanket-like sections of outer and inner surface of coated Fiberglas fabric with core of Fiberglas insulation between them.



**HELICOPTER** delivers 20-ft. sections of pipe for laying in impassable Louisiana swampland. Pumps, storage tanks and other materials for pipelines are successfully carried by helicopters. Acme Photo

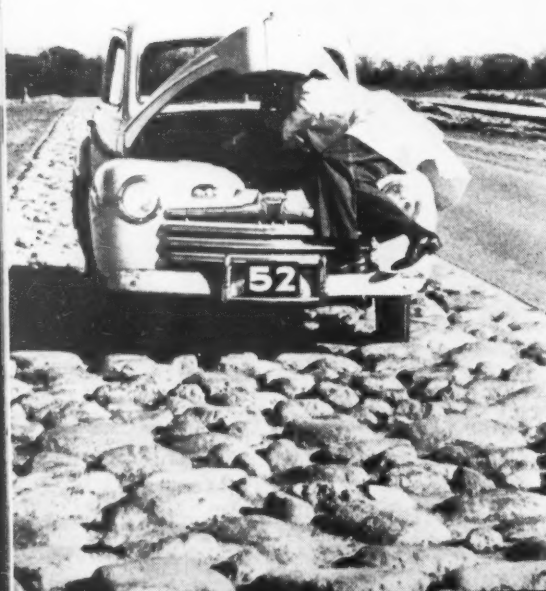


← **GREEK WORKMEN** (left) use old-fashioned methods to cut lumber for rebuilding destroyed villages in northern mountains of Greece. They are paid with wheat shipped in by UNRRA. Wide World Photo

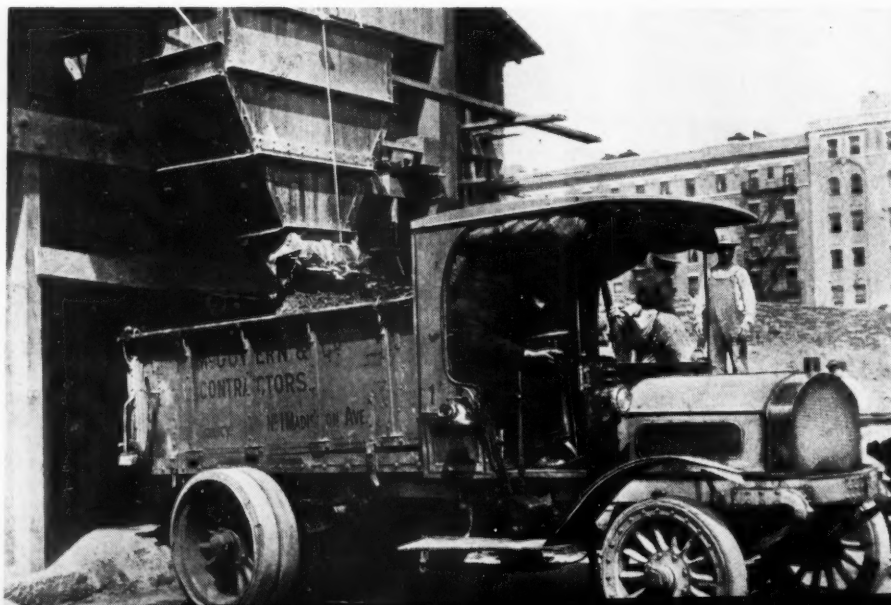
# Job Oddities

Page 108

**SQUEAKS AND RATTLES** in 1946 Ford passenger car (below) are discovered by driving production model over cobblestone torture course at proving ground at Dearborn, Mich., while skilled automotive technician gets under hood to listen. Acme Photo



**LAST WORD IN TRUCKS** IN 1913 is this Mack dumper (below) used by P. McGovern & Co. to help build New York's subway system. In those days there was stiff competition between trucks and horses but automotive industry, now celebrating Golden Jubilee, won.



# Bubbles in Concrete

## Improve Its Quality At No Extra Cost

**Better Concrete:** By creating billions of properly distributed microscopic air cells in the concrete mix, Atlas Duraplastic air-entraining cement makes the concrete more workable, more plastic, more cohesive and more uniform.

**More Durable Concrete:** Because of the extra plasticity imparted by the billions of tiny air bubbles, Duraplastic cement requires less mixing water for a given slump. This reduces segregation and bleeding, fortifies the concrete against the effects of freezing and thawing weather, and renders paving concrete highly resistant to the scaling action of de-icing salts.

**No Extra Cost:** Duraplastic cement calls for no additional materials—merely the same care and good workmanship regularly employed. It produces concrete that spreads, screeds and finishes easily. It complies with ASTM specifications, sells at the same price as regular cement, and makes better concrete at no extra cost.

**Details about Duraplastic cement** are summarized in a pamphlet sent on request. Write to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

**OFFICES:** New York, Chicago, Albany, Boston, Philadelphia, Pittsburgh, Cleveland, St. Louis, Minneapolis, Duluth, Kansas City, Des Moines, Birmingham, Waco.

CM-D-32

# ATLAS DURAPLASTIC

AIR-ENTRAINING PORTLAND CEMENT

TRADE MARK REG.  
U. S. A. C. CO.



U. S. STEEL RADIO SHOW—*Sunday Evenings—Consult local newspaper for time and station.*



# THE TRUTH ABOUT

UNTIL now, you've heard about Aquella from everybody but us. First...there was Kurt Steel's absorbing article ("Dry Cellars") in the December 15, 1945 issue of Forbes Magazine.

Second...there was the condensation of this same article which appeared under the caption "Water Stay Away from My Wall" in the January issue of the Reader's Digest.

Third...there was a flood of anonymous letters containing garbled references to a Federal Trade Commission complaint, as well as a copy of a letter dated December 29th, 1945, which purported to have come from the Director of the United States Bureau of Standards.

## Why you've not heard from us until now...

In the first place, we were far too busy getting out production to meet the nationwide demand for Aquella. Thousands wanted to be Aquella distributors. Thousands wanted to be Aquella dealers and contractors. And many, many thousands more wanted to buy Aquella for homes, institutions, and factories. Aquella had captured the

public's imagination overnight.

Furthermore, at first we thought that this anonymous attack was just the work of some small, misguided competitor. Then, when the vast extent of the campaign became apparent, we conducted an investigation into the source and motives behind the attack.

*The complete details and documentary evidence are to be found in our brochure "The Truth About Aquella."*

## The Bureau of Standards never intended to discredit Aquella

On December 29, 1945, an unsigned letter came from the office of the United States Bureau of Standards written to Forbes Magazine and the Reader's Digest, protesting the publication of Mr. Steel's article.

After the Director of the Bureau was informed this letter was being reproduced and circulated by the hundreds of thousands for the purpose of dis-

paraging Aquella, the Bureau refused to permit further public distribution of copies.

What the Bureau then did was to write *other letters* stating that the communication of December 29, 1945 was not intended to discredit Aquella.

Nevertheless, thousands of copies of that early letter still continued to be circulated through "mysterious sources."

*The complete details and documentary evidence are to be found in our brochure "The Truth About Aquella."*

# T AQUELLA...

## The Controversy over "Waterproofing" before the Federal Trade Commission

For sometime back there has been a controversy between the Federal Trade Commission and the waterproofing-industry-at-large concerning the use of the word "waterproof" in advertising. What it boils down to is a definition of the word "waterproof" and not any misstatement of fact. Members of the Commission have their definition; those in the waterproofing industry have theirs. The maker of Aquella was only one of

many firms that were cited on the issue.

This issue was raised almost a year ago and a complete answer was promptly filed. No further action was taken.

In the meantime, however, there emanated from the same "mysterious sources," thousands of notices of the Commission's citation—with the dateline conspicuously omitted.

*The complete details and documentary evidence are to be found in our brochure "The Truth About Aquella."*

## Now about AQUELLA itself!

From the time it proved itself on the French Maginot Line, Aquella has demonstrated its effectiveness against moisture and seepage in thousands of instances, in various types of masonry construction. There is no single instance where Aquella

has ever failed *when properly applied!*

Further, we are continuing permeability tests under hydrostatic pressures which far exceed any that were ever used on Aquella by the Bureau of Standards.

## Complete Documentary Evidence for you!

We have prepared a fully documented brochure which contains the complete story of Aquella.

If you are in the waterproofing industry...if you sell waterproofing...if you are counseling customers or clients on waterproofing...or if you are a buyer of waterproofing materials, you owe it to yourself to know the truth!

A copy of this brochure is yours for the asking. Simply write us on your letterhead.

**PRIMA PRODUCTS, INC.**

NATIONAL DISTRIBUTORS

Dept. R, 10 East 40th Street, New York 16, New York



# CONSTRUCTION EQUIPMENT NEWS

## JUNE 1946 REVIEW of Construction Machinery and Materials



**CONCRETE HANDLING EQUIPMENT**, known as Dumpcrete, is built of all-welded high-tensile steel with important weight-saving features. Novel design permits discharge of concrete as high as 6 ft. 3 in. from ground level. Specially designed and arranged hydraulic hoisting mechanism provides dumping angle of 90 deg. to make possible clean and fast discharge. Adjustable baffle, deflector plates and inverted center keel provides discharge similar to that of bottom-dump bucket. Standard equip-

ment also includes specially designed gate, hopper for directional discharge and two sections of chute, one 5 ft. 6 in. in length and other 5 ft. Gate may be easily removed for hauling other materials. It is produced in two models, 2C and 4C, with respective rated concrete capacities of 2 and 4 cu. yd. Struck volumes are 3.5 and 6.25 yd. Height of discharge is 4 ft. 3 in. for Model 2C and 6 ft. 3 in. for Model 4C when mounted on standard truck chassis.—**Maxon Construction Co., Inc., Dayton, Ohio.**

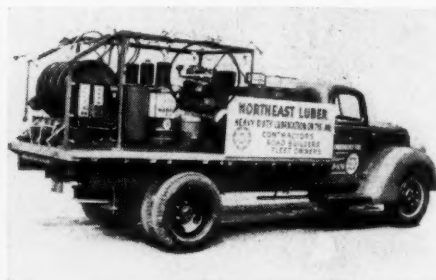
**LAND PLANER**, designed for one-man operation, is built in three 60-ft. models, each of which may be readily shortened to 30 ft. for use on exceptionally rough ground. It has boxed frame of heavy 5-in. steel channels

and interchangeable standard wheels, corners, side frames and hitches. Four corners are supported on steel wheels carried in fork standards and are supported on Timken roller bearings. Bronze wheel bearings are scientific-



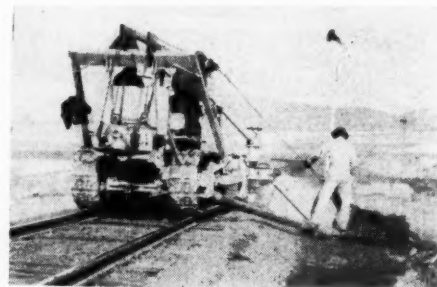
cally lubricated and dustproofed. Heavy steel plate 36-in. wheels provide either 18- or 24-in. tread and drawbar demand ranges from 40 to 90 hp., depending on bucket adjustment.—**Pacific Supply Co., 206 S. Spring St., Los Angeles 12, Calif.**

**SERVICE STATION ON WHEELS** brings high-pressure lubrication and related services to equipment on job. Completely self-contained, it has lubricant tanks, hose reels, compression pumps, tools and accessories built in. On an OTC-2 electric generating plant,



mounted on air compressor tank, furnishes current for lights and battery charging and serves as prime mover for air compressor. Engine is two-cylinder, air-cooled, gasoline-driven prime mover that develops 3.1 hp. at 1800 rpm.—**Gray Co., Minneapolis, Minn.**

**CRAWLER-TYPE TRACTOR** is equipped with "track-walking shoes," special type pads having flange running fore and aft in manner of car wheel flange, which enable tractor to operate on railroad track like any other piece of rolling stock. Can also



maneuver on and off track unaided and is readily used for off-track work. Machine is fitted with adjustable wing blade capable of being set at desired angle of roadbed grade, so it spreads ballast uniformly and maintains grade accurately. Blade attachments are easily removable.—**Electric Steel Foundry, 2141 N.W. 25th Ave., Portland 10, Ore.**



# Smooth Accuracy...

**EVERY TIME WITH ADAMS MOTOR GRADERS**

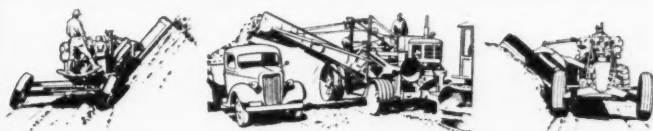
● It is no accident that Adams Motor Graders are predominantly preferred by contractors and city and highway officials. They have learned through long experience that Adams Motor Graders are outstanding in design and performance—*unequaled for smooth, accurate work on roads, streets and airports.*

For example, Adams' *Positive-Acting Mechanical Controls* assure fast, accurate blade and scarifier adjustments; *Built-in Rigidity* eliminates lost motion in controls, holds blade

and scarifier solidly in place; *Balanced Weight Distribution* provides always-ample pressures for forcing blade and scarifier into hard materials; *8 Overlapping Forward Speeds* assure exactly the right speed to do any given operation at the fastest practical rate.

Discover how these and other Adams features will do all grading jobs *better, faster, more economically.* For the complete performance facts, see your near-by Adams dealer.

J. D. ADAMS MANUFACTURING CO., INDIANAPOLIS, IND.



# ADAMS

**ROAD BUILDING AND  
EARTH-MOVING EQUIPMENT**



# Round the World...



## The Best Combination —

In any locality it's International Tractors and *the finest* of matched earth-moving equipment that proves to be the best combination for profitable operations. • International Crawler Tractors deliver more engine horsepower to the tracks through generous use of roller bearings and ball bearings in power transmission and drive shaft assemblies. • International Diesel Tractors start easily and instantly in any weather yet deliver *full Diesel* economy in their effective use of low cost fuel. • International's advanced engineering adds other marked advantages which only International Tractors provide to keep maintenance at a minimum and to assure peak performance under all conditions at all times. • Construction gains momentum under the driving power of International Industrial Tractors and Engines. • Seabees

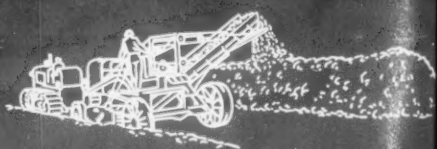


Above: It's a TD-18 TracTracTor cutting out a roadway on a hillside with a bullgrader blade. Wherever roads are built, Internationals speed the job, help keep costs down to bedrock.

At Right: This International TD-18, grading → for a new building, has a loaded uphill job which its power-packed, full-Diesel engine handles easily.



Opposite Page: An International TD-9, with bullgrader → and 2-wheel scraper, builds an addition to an airport in a resort community. Fast worker! It averaged a yard per minute on 100-ft. hauls at a cost for fuel of \$1.43 per 9-hour shift.

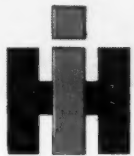


# INTERNATIONAL Tractors

*Speed up Construction  
at New Low Cost*

and Marines used them on the beaches wherever they landed and for airstrip construction. They proved the stamina of Internationals 'round the world and showed with what speed construction could be completed. • And contractors everywhere are today enjoying the new low costs which International's economical use of fuel and oil and manpower makes possible.

- Check with the nearest International Industrial Power Distributor the many outstanding features of International Tractors—Diesel or gasoline—and profit by the use of International Power on the many important projects you're planning.



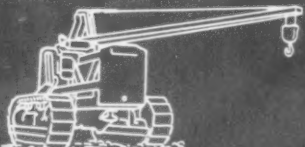
Industrial Power Division

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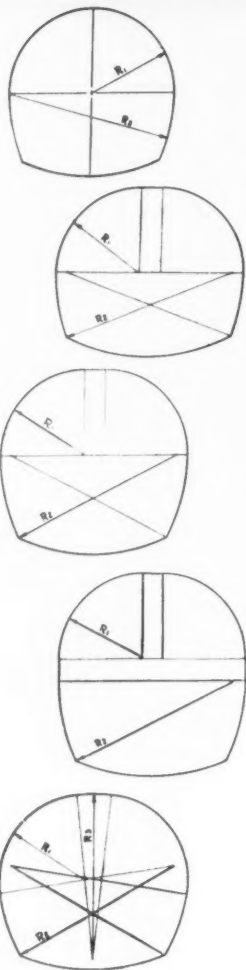


## INTERNATIONAL Industrial Power





# WHERE CROSS-SECTIONS CHANGE FROM STATION TO STATION



Adjustment methods for  
varying cross-sections

Coordinating forming methods with the concrete design may effect large savings in the construction of tunnels, conduits, walls and other concrete structures.

If the job requires 20 to 30 repetitions of similar unit pours, it is generally conceded that steel forms should be specified.

Blaw-Knox Steel Forms can be designed for easy adjustment to varying sizes of cross-sections. Advantage can still be taken of their economies and time-saving features even when the cross-sections change from station to station.

In simple diagrams and quickly read explanations the Blaw-Knox Steel Form Bulletin tells how, when, and where to specify steel forms.

**BLAW-KNOX DIVISION**  
of Blaw-Knox Company  
2086 FARMERS BANK BLDG.  
PITTSBURGH, PA.

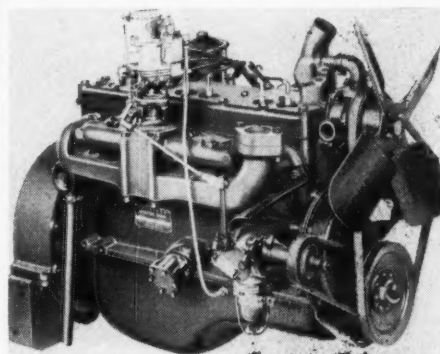


For the man who  
builds TUNNELS, SEWERS,  
WALLS and other concrete  
structures

Send for Bulletin No. 2035

## BLAW-KNOX STEEL FORMS

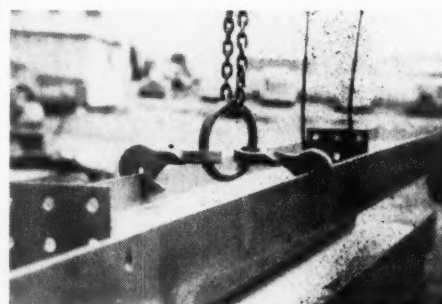
**INDUSTRIAL ENGINES**, Models 5, 7 and 12, have cylinder bores made integral with block to obtain perfect alignment with crankshaft, insure against possible water leaks and obtain best possible heat transfer. Full length water jacketed bores assure



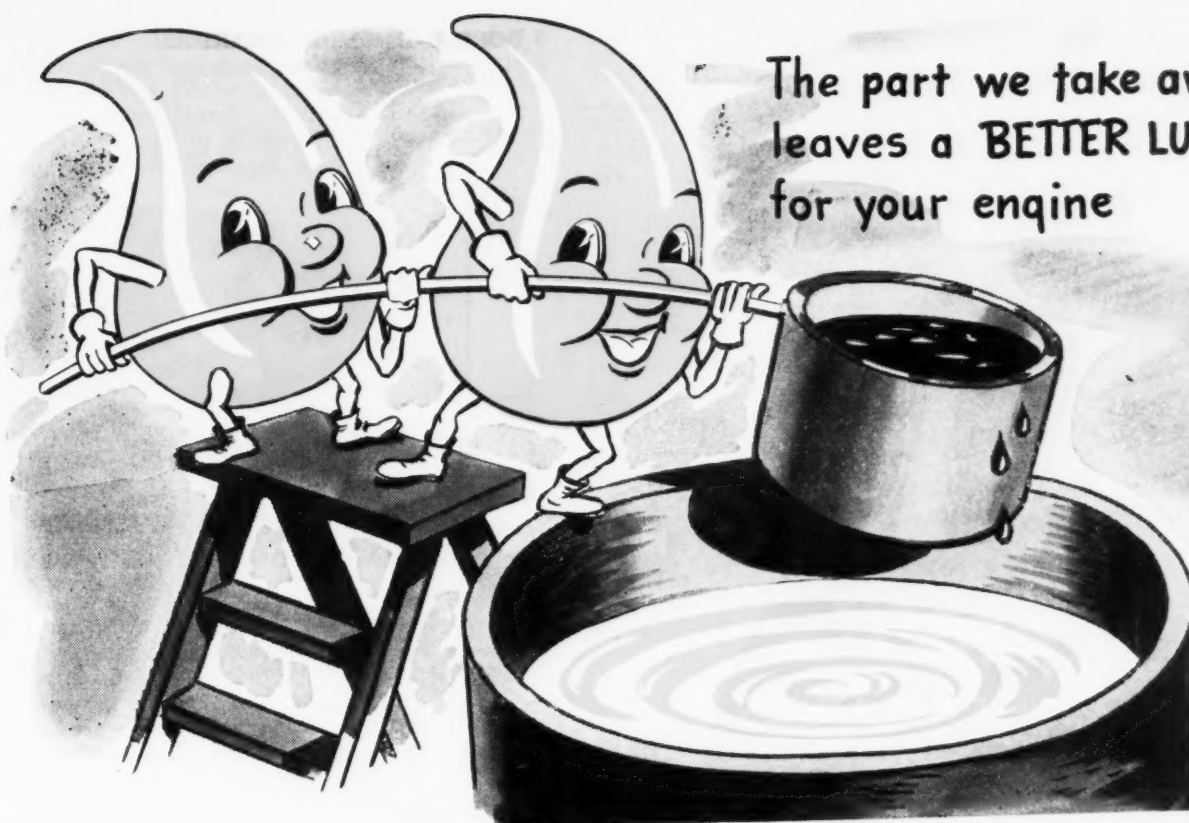
uniform water temperature. Exhaust valves are water cooled and oil temperatures are controlled by full length water jackets and high thermal efficiency. Flywheel and crankshaft, central points of vibration, have parts balanced to 1/2-in. oz. Sodium-cooled exhaust valves are optional equipment. Parts subject to wear are super-finished. Piston rings are chrome-plated.—**Chrysler Corp., Detroit, Mich.**

**POT TO SPREAD** chips, sand, gravel, slag, salt, calcium chloride, cinders, etc., has big shovel opening for easy filling and comfortable carrying handle. Opening is adjustable and, combined with big back handle, gives perfect flow control in pouring solids. Shipping weight is 7 lb.; diameter 10 in.; height 15 in.; and capacity 4 1/2 gal. or 1/2 cu. ft. of dry materials.—**Aeroil Products Co., Park Ave. at 57th St., West New York, N. J.**

**ONE-OPERATIONAL LIFTING DEVICE**, known as Diamond torque hook, can lift and nest-stack structural steel shapes, such as beams, girders,


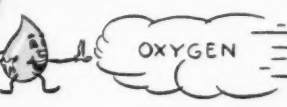




channels, etc., simply by slipping on hook. Gripping surface is more than 7 in. Available in two sizes, one of which weighs 20 lb. and has 7,000-lb. capacity and other 33-lb. with 10,000-lb. capacity.—**Elizabeth Iron Works, P.O. Box 360, Elizabeth, N. J.**



The part we take away  
leaves a **BETTER LUBRICANT**  
for your engine

## THESE FOUR **TALPEX** PERFORMANCE FACTORS SAFEGUARD HIGH-SPEED DIESELS

<p><b>1</b></p>  <p>Oil components that readily oxidize are removed by solvent-extraction refining.</p>	<p><b>2</b></p>  <p>Talpex is protected with an antioxidant that holds to a minimum the formation of corrosive compounds, lacquer and sludge.</p>
<p><b>3</b></p>  <p>Corrosion-preventive properties of Talpex give extra protection—better performance, longer life.</p>	<p><b>4</b></p>  <p>Its detergent, dispersant properties keep contaminants in suspension—pistons, rings, valves and ports clean.</p>

THAT'S perfectly good engine oil being removed from lube oil "stock" that is destined to become Shell Talpex. Perfectly good, that is, except for its bad habit of quickly "mating" with oxygen. Such oxidation would result in the formation of corrosive compounds, sludge and lacquer—all bad for your engine.

Shell uses a special solvent-extraction process to take away these readily oxidized compounds. Next, the refined Talpex is further protected with an antioxidant, and is given corrosion-preventive and detergent properties.

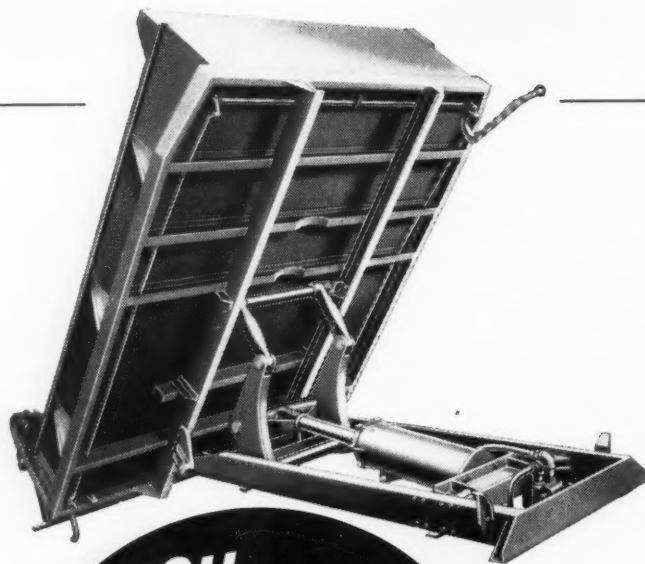
If the oil you are now using doesn't have these four performance factors, your Diesels aren't getting the benefit of all that's new in lubrication—and you had better change to Talpex!

The Shell Lubrication Engineer will give you sound advice about the lubrication of any type of Diesel, whether slow, medium, or high speed. Write for a copy of Shell's booklet, "The Fundamentals of Diesel Lubrication." Shell Oil Company, Incorporated, 50 West 50th St., New York 20, N. Y., or 100 Bush St., San Francisco 6, California.

# SHELL DIESEL LUBRICANTS







**YOU  
PROFIT**

**FROM THESE 4 FEATURES  
OF PERFECTION DESIGN**

The smooth and easy manner with which Perfection Hydraulic Hoists and Dump Bodies work together, quickly shows you the importance (profit to you) of . . . . .

- 1 Double, compound-type lift arms . . . . .
- 2 Lifting power applied nearest the center of the load . . . . .
- 3 Lifting power distributed under full length and width of body . . . . .
- 4 "Cushion-Stop" drop feature . . . . .

These are just a few of the PERFECTION features which pay off in less wear and tear on the hoist and body and in more efficient operation and use of power.

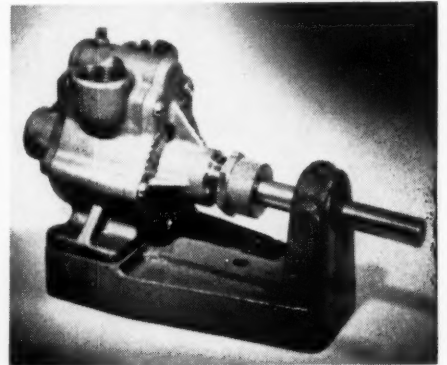
Built for all makes and models of trucks. Write for bulletin and names of nearest distributors. . . .



**THE PERFECTION STEEL BODY COMPANY**  
GALION, OHIO

**PERFECTION**  
TRUCK BODIES AND HOISTS

**DOUBLE - IMPELLER GEARLESS PUMP** has standard 1-in. connections and built-in external driveshaft bearing and base. Impellers are made of several layers of pressure-vulcanized, laminated material and can pump



equally well in either direction. Built-in driveshaft bearing and base eliminates side pull when pump is powered by belt drive and pulley and furnishes solid base on which to mount pump. Impellers pass sand, grit, filings or sludge without stalling, jamming or stripping and without damage to bronze pump body and are easily replaced when six-screw face plate is removed. Overall dimensions are 10½x4¼x5¾ in. Capacity varies from 7.5 gal. per minute at 600 rpm. to 23 gal. per minute at 1800 rpm.—ECO Engineering Co., 12 New York Ave., Newark, N. J.

**Contractors! Estimators!  
Foremen! Timekeepers!**

**USE AN ADDING  
MACHINE** wherever  
you go—on any job!

**Lightning** PORTABLE  
**ADDING  
MACHINE**

**\$12<sup>95</sup>**

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Adds  
as Easily as  
Dialing a Telephone!

Desk Model . . . 14 x 4½ inches . . . yet lifts out to fit brief case! Capacity up to \$99,999.99. You'll become an expert in its use in 10 minutes. Small enough to use as straight edge on columns of figures while adding. On the market 30 years . . . 151,000 owners. **ONE YEAR'S GUARANTEE.** Send check, money order or order C. O. D. Return in 10 days if not absolutely satisfied.

**THE LIGHTNING ADDING MACHINE CO.**  
543 S. Spring St., Dept. 564, Los Angeles 13

**You've got to be  
GOOD  
to wear it!**



Like a Phi Beta Kappa key, the AGC rating plate represents outstanding achievement. To wear it, a mixer or paver must earn the right through guaranteed capacity and performance.

You can depend on equipment wearing the AGC rating plates. There's no guesswork when you estimate a job. You know in advance what your mixer or paver will do and can plan accordingly.

Why not be sure? Insist on the AGC rating plate on every mixer or paver you buy. Taking a chance can be expensive!



## MIXER MANUFACTURERS' BUREAU

Affiliated with the Associated General Contractors of America, Inc.

### Member Names

Chain Belt Company  
Milwaukee, Wis.

Construction Machinery Co.  
Waterloo, Iowa

Koehring Company  
Milwaukee, Wis.

Ransome Machinery Co.  
Dunellen, N. J.

Kwik-Mix Company  
Port Washington, Wis.

The Foote Co., Inc.  
Nunda, N. Y.

The Jaeger Machine Co.  
Columbus, Ohio

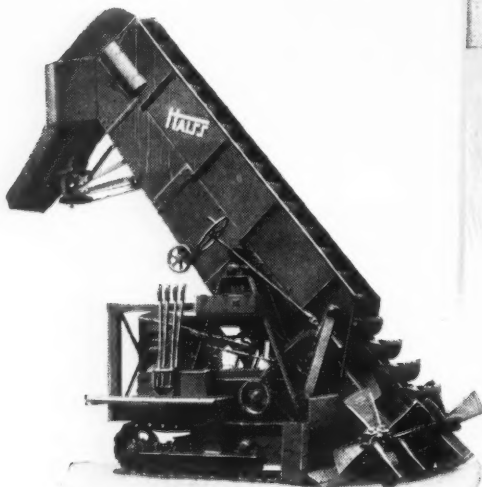
The T. L. Smith Company  
Milwaukee, Wis.

The Knickerbocker Co.  
Jackson, Mich.



MEMO TO ALL CONSTRUCTION SUPTS.

*Haiss Service Costs upset  
all statistics. Better check it  
for our loading requirements  
F.W.A.*



Simple Conversion Mountings. Haiss simplified design of the Model 75 provides for interchange of wheels and creepers, in the field. Standard parts; no shop work.

Watch a Haiss in action—or, better still, get the *feel* of its ease of control as it “crowds” a stock pile or bank—and in no time at all you’ll see why Haiss doesn’t aim at price.

What Haiss does aim at—and builds—is a Loader that can absorb punishment... a Loader that will deliver more yards for more years with less

maintenance and lower operating costs.

To insure this *bargain-on-the-job* Haiss makes full use of simple, functional design... takes the pick of the best alloy steels available... designs its own oil-bath-enclosed transmission—and powers the works with a motor rugged enough to “take it.”

Haiss operating efficiency has been paying big dividends for Haiss owners for more than a half-century. Investigate now what a Haiss can do for you. Catalogs containing complete information will be sent promptly on request.

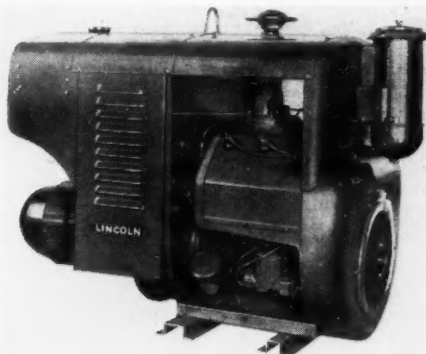
**GEORGE HAISS MFG. CO., INC.**

139th Street and Canal Place  
New York 51, N. Y.



**PORTABLE CONVEYORS ★ SNOW LOADERS ★ CLAMSHELL BUCKETS**

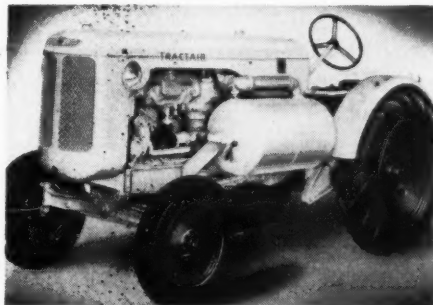
**PORTABLE GASOLINE - ENGINE DRIVEN WELDER**, known as Shield-Arc Jr., has current range of from 40 to 250 amp. and measures 24x48x30 in. Provision is made on output panel for three ranges of output current. Generator controls are mounted in-



side enclosed cabinet above generator. Welder is powered by Wisconsin air-cooled 4-cylinder V-type engine, with speeds between 2100 and 1500 rpm. Canopy protects unit from falling objects and weather. Two transverse mounting rails are provided for bolting to floor or platform. Net weight is 660 lb. and shipping weight 705 lb.—**The Lincoln Electric Co., Cleveland 1, Ohio.**

**REPLACEABLE - FACE HAMMER** speeds construction, repair and metal working operations on surfaces that must not be marred. Exclusive split-jaw construction permits speedy replacement of Basa faces, which do not shrink, expand, chip or disintegrate and are not affected by chemicals.—**Greene, Tweed & Co., Bronx Blvd. at 238th St., New York, 66, N. Y.**

**AIR COMPRESSOR**, called Tractair, is combined as integral part with 35-hp. wheel tractor. This 105-c.f.m. air power unit has 6 cylinders and cylin-



der block is one casting with hardened removable wet cylinder sleeves and precision, shell-type bearings. Tractor unit is mounted on four pneumatic tires, has five-speed transmission and can be operated as conveyor while maintaining full utility of tractor.—**LeRoi Co., Milwaukee, Wis.**

## *the NEW* **GALION NO. 402 MOTOR GRADER**



Built small for **ECONOMY**, the **NEW Galion No. 402 Light Weight Motor Grader** is plenty rugged. It has both the power and blade pressure to give you top performance under all ordinary blading conditions.

### **CHECK THESE OUTSTANDING FEATURES:**

Engine over axle assures full tractive effort on drive wheels.

Sturdy single member frame gives full view of blade and scarifier action.

Hydraulic control for easy and speedy adjustment of blade and scarifier.

Centralized control—simplified operation.

Rigid circle and moldboard construction.

Ball and socket connection between draw bars and head block.

Extra-rugged front axle construction.

**HERE'S A  
LIGHTWEIGHT  
THAT CAN  
REALLY  
TAKE IT.**

The **NEW Galion No. 402 Motor Grader** is ideally suited for maintenance work in townships, counties, cities, and villages.

Catalog No. 288 gives complete information—write for your copy and name of Distributor nearest you.

**THE GALION IRON WORKS & MFG. CO.**

**GALION, OHIO**

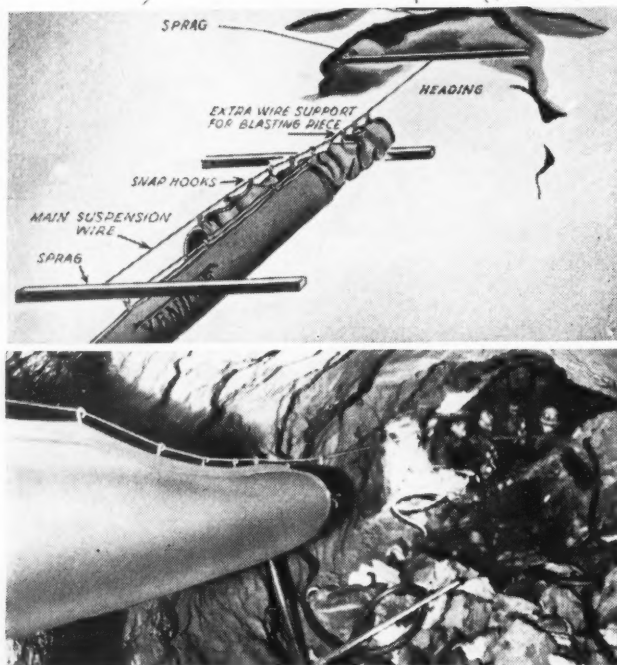
**U. S. A.**

**GALION**  
IRON WORKS

**GRADERS • ROLLERS!**



# After Blasting Save Work-Time With "VENTUBE"\*



When a charge is shot, headings fill with dust. Temperature goes up. Men and machines must remain unprofitably idle until proper working conditions are restored. Du Pont's flexible, synthetic-rubberized ventilating duct quickly clears dust, cuts short that idle time. Thus it speeds tunnel-driving, reduces costs. See more features of "Ventube" in box at right.

For further details, or consultation with Du Pont Technical Service, just write E. I. du Pont de Nemours & Co. (Inc.), Fabrics Division, Fairfield, Conn.

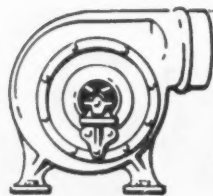
\*"VENTUBE" is Du Pont's registered trade mark for its flexible, synthetic-rubberized ventilating duct.

**1. Special blasting section of "Ventube"** is speedily withdrawn before blasting—saves time and labor. After blast, it slides quickly back into position for ventilating.

**2. Fresh air sweeps heading** clear of dust in a few minutes—men get back to work without delay. Thus "Ventube" and a portable blower increase efficiency, speed tunnel-driving, lower costs.

## 6 REASONS WHY "VENTUBE" SERVES YOU BEST

- 1. Low cost**—"Ventube" is less expensive to install than rigid ventilating systems.
- 2. Rapid installation**—special patented couplings make airtight connections swiftly. One man can install 100 feet per hour.
- 3. Flexible**—bends around curves, easily directed to heading, takes up less room in openings.
- 4. Compact**—folds into small bundles for storage.
- 5. Light**—easy to take from job to job. One man can carry 100 ft.
- 6. Clears heading quickly**—cuts idle time after blasting, speeds tunnel-driving.



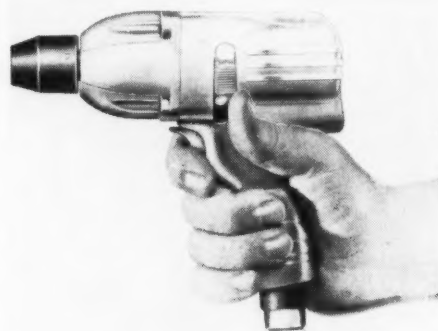
## DU PONT "VENTUBE"

REDUCING COSTS THROUGH BETTER VENTILATION



BETTER THINGS FOR BETTER LIVING  
...THROUGH CHEMISTRY

**PNEUMATIC IMPACT WRENCH** drives and removes nuts, bolts and cap screws up to 3/8-in. thread size. Rotatively striking impact jaws are



set at wide radius from spindle center to reduce stress, and short rigid spindle shank delivers blow close to work. Tool weighs 3 3/4 lb. and is 5 7/8 in. long.—**Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago 6, Ill.**

**WATERPROOFING COMPOUND** for use with masonry block construction can be applied like paint after walls are made soaking wet. In process of drying out, walls suck in compound where it expands and sets with extreme hardness. It is washable, smooth, grime-resisting and attractive.—**Kay-tite Co., West Orange, N. J.**

**HIGHWAY CONSTRUCTION AND MAINTENANCE TRUCK**, 4-ton capacity model HG, is designed to mount such optional equipment as body, hoist and underbody blade and snow plow fittings. Clearance of 22 1/2 to 24 13/32 in., with relatively



low frame height, is provided between low point of transfer case of truck and ground. It is engineered to grade roads at 5 to 15 mph. and maintain roads up to 20 mph. Five-speed transmission is of rugged design and provides constant mesh, helical gears in 3rd, 4th and 5th speeds. Power is transmitted to front and rear drive shaft through shock absorbing silent chain and fully compensating center differential.—**The Four Wheel Drive Auto Co., Clintonville, Wis.**

**"A tire has  
to be *Tough*  
in our league..."**

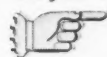


**FRANK GEROSA, Treasurer**  
Gerosa Haulage & Warehouse Corp.  
New York, N. Y.

● "Our trucks tote valuable cargo in all weather and under all road conditions. Neither we nor our customers can afford to have a tire go out on us. After exhaustive—and costly—experimentation we've selected **Armstrong Tires**. In our league tires have to be plenty tough—and these Armstrong's are as tough and long-lasting as they come. We know they are dependable, give us more mileage and are priced right. We don't know of a better tire—and you can quote us!"



**W**E didn't write that—Mr. Gerosa did! Scores of other commercial car operators have discovered, as he has, that you can't buy a better tire than an Armstrong. It's long on performance, sturdiness and mileage—yet short on cost. For more than thirty years Armstrong technicians have developed and built into our products new features that make for longer tire life, an accomplishment that spells economy to the buyer who has both mileage and cost in mind.



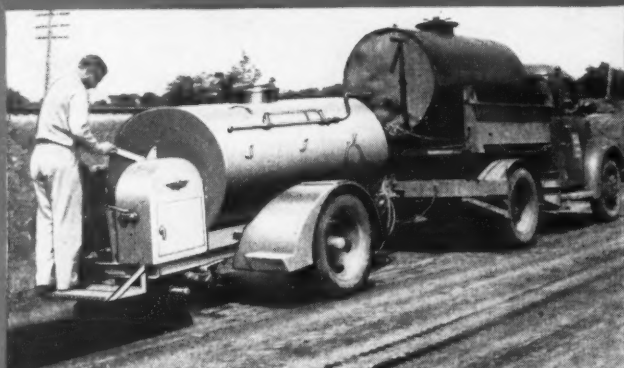
For literature or information write your Armstrong distributor or to Armstrong Rubber Company.

# ARMSTRONG TIRES

Manufacturers of Quality Tires and Tubes Since 1912 • General Offices and Plant—460 Elm Street, West Haven 16, Conn.



# Protect THE BASE with a weather-proof COVER



## OTHER PRODUCTS

Emulsion Spray Units • Kerosene and Distillate Burners • Supply Tanks • Tool Heaters • Asphalt Tools • Street Flushers



Entry of water into the sub-grade destroys the base. In no situation does the adage "A stitch in time" apply more truly than in maintenance of the surface. Seal coating the surface and repairing small breaks promptly will have much to do with keeping down future costly expenditures. Weather-proofing is the cheapest insurance towards protecting the original investment in roads. Not only does it protect the base, but also relivens old asphalt surface.

For details on how to weatherproof your highways or streets write THE ASPHALT INSTITUTE, 801 Second Avenue, New York City.

For details in selecting a pressure distributor, maintenance distributor or patching kettle, contact us for specifications and prices.

**WRITE FOR NAME OF NEAREST DEALER**

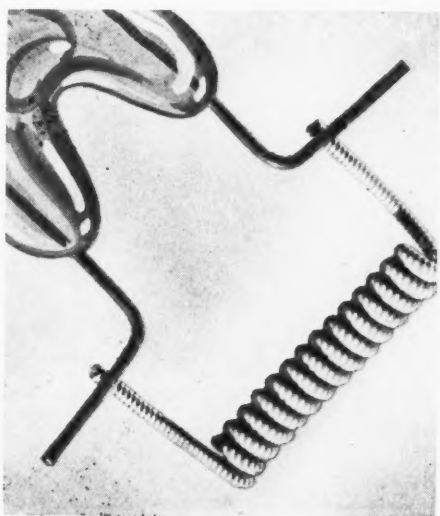
**Standard Steel Works**  
NORTH KANSAS CITY, MO., U. S. A.

**MECHANICAL ARM** is used to lift and transport many types of loads. This power truck, equipped with horizontal non-swivel type boom, moving vertically with its shoulder riding in



upright columns of truck, can carry loads up to 3,000 lb. Boom is available in lengths of 72, 66 and 60 in. from face of upright. At lowest point hook is 22 in. above floor level; at highest 8 ft.—**The Elwell-Parker Electric Co., Cleveland, Ohio.**

**FLUORESCENT LAMPS** for office, commercial and industrial lighting are said to make possible brighter but more mellow light, double lamp light and instant illumination, assuring not only substantial maintenance savings but greater efficiency and quick dependable action. Laboratory tests in 40-watt size reveal



that new color, Safreen, gives 20-percent more light than standard daylight fluorescent. Tests further show that this lamp boasts 5,000-hr. life against 2,500-hr. rated life of standard lamp. Feature of instant-light eliminates need for starters and will do away with annoying, time-consuming flickering that attends turning on of standard fluorescent installations.—**Duro Test Corp., North Bergen, N. J.**

**Heltzel Steel Form & Iron Co., Warren, Ohio.**

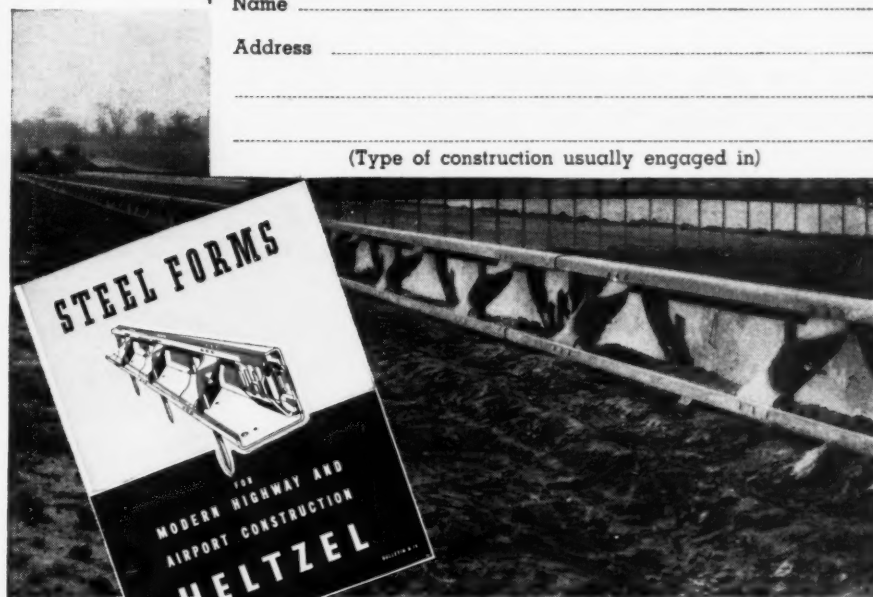
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Steel Forms for  
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Forms to match.

Steel  
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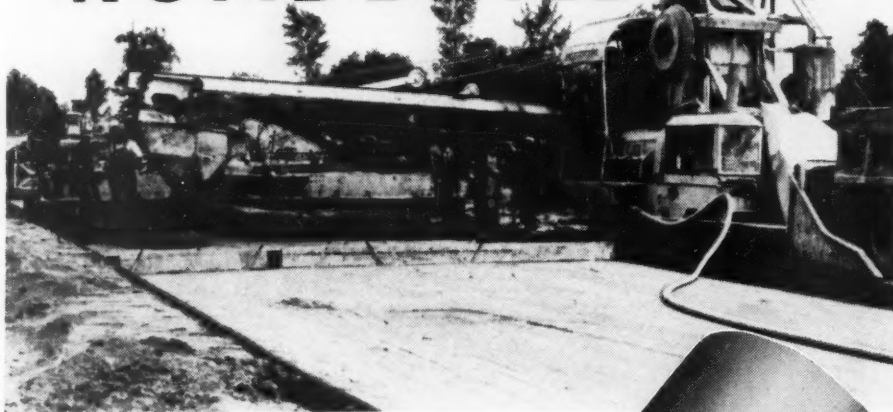
Rigid Radius Curb  
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Curb and Gutter Form  
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**HELTZEL** STEEL FORM & IRON CO.  
WARREN, OHIO • U. S. A.



# Keep YOUR Pavers and Mixers Going Steady, with "ROADBUILDERS"



## "ROADBUILDERS" WATER HOSE . . .

a Goodall "Standard of Quality" product, and your best assurance of top performance from all heavy-duty roadbuilding equipment.



The tough, wear-resistant red cover has what it takes to withstand constant dragging over rough concrete and roadside rubble. The husky, hard-woven duck carcass carries high pressures with a wide margin of safety. The long-life tube will hold its size in the heat of the summer sun. Made in 1", 1¼", 1½" and 2", in maximum lengths of 50 feet.

Contact our nearest branch for prices and delivery of "Roadbuilders" and other Goodall hose belting, boots, clothing and packing . . .  
"Engineered to Your Job."

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RUBBER COMPANY • INCORPORATED

**THE GOODALL-WHITEHEAD COMPANIES**

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WE ARE  
PARTICIPANTS IN THE  
OWNERSHIP AND OPERATION  
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NATIONAL SYNTHETIC RUBBER  
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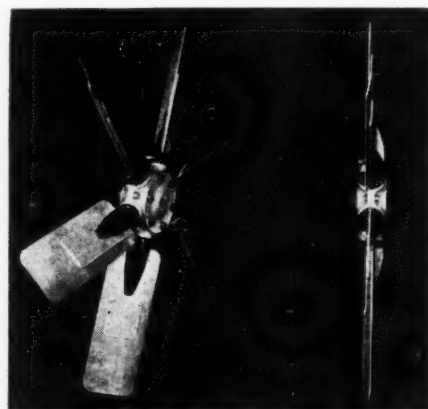
Established 1870

**VULCANIZER** uses toggle action, "bellows principle" wings and rubber cushion that gives upward counter thrust to insure accurate pressure and compensate for varying thicknesses of tube rubber. Eight-bearing rocker arms provide smooth



action. Swing-down tube last enables operator to perform even buffing operation on machine. Exceptionally deep throat admits large tubes for proper centering and specially designed spiders allow ventilation for fuel combustion. V-65 Match Patch vulcanizer is made of tough heavy-gage steel.—J. W. Speaker Corp., Milwaukee 12, Wis.

**THERMOSTATICALLY CONTROLLED FAN** provides uniform temperature distribution throughout engine compartment on heavy-duty equipment, such as trucks, stationary engines, tractors, shovels and diesel locomotives. Automatically adjusts itself to produce uniform operating conditions by means of vari-



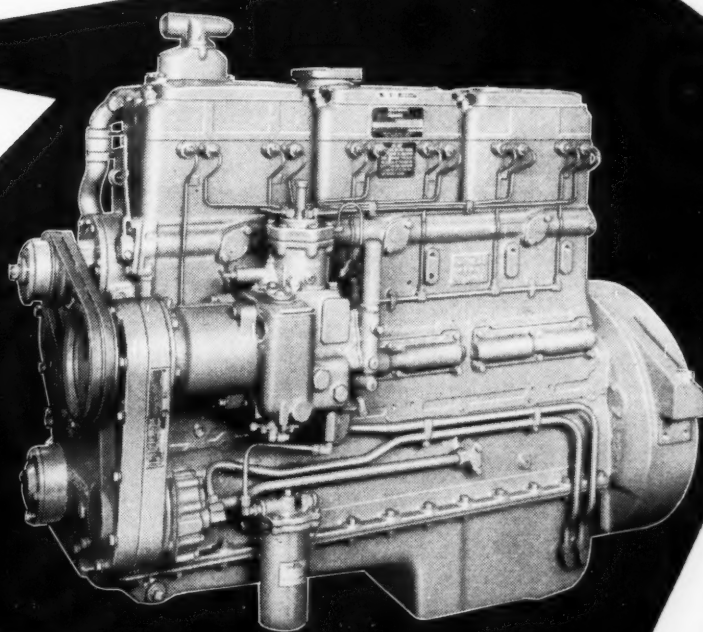
able pitch control of fan blades. This is accomplished by built-in, heavy-duty Vernatherm Thermal power element. With engine at low load or on cold days, fan blades might be at zero or reverse pitch. Vernatherm automatically changes pitch, through infinite variation, to maximum required under heavy loads or extremely high ambient temperature.—Evans Products Co., 15310 Fullerton Ave., Detroit 27, Mich.

**Properly Rated . . . Properly Applied,  
Cummins Diesels Set the Pace in  
Dependability and Low-Cost Power!**

**CUMMINS**  
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SINCE 1918...PIONEER OF PROFITABLE POWER  
THROUGH HIGH SPEED DIESELS



**CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA**



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SOCONY-VACUUM OIL COMPANY, INC., and Affiliates: Magnolia Petroleum Company, General Petroleum Corporation

## This Complete Lubrication Service short-cuts every time problem on your Job!

Are equipment breakdowns delaying vital operations . . . making tight work schedules *tighter*?

Here's *real* help in minimizing machine slow-downs and work stoppages — a service that provides the exactly right oil or grease to protect every part of every machine you use!

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We make regular on-the-job deliveries *anywhere* to help you reduce field interruptions — simplify inventory problems — minimize bother with rush orders and follow-ups.

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*Contractors'*  
**Lubrication  
SERVICE**

**CORRECT LUBRICATION  
FOR EVERY PART  
OF EVERY MACHINE**

*-Real Help with  
Maintenance Problems!*



# Famous Stops



## THE WORLD'S RECORD

**STOP** FOR THE SWIFT, HARD-BATTLING PACIFIC SAILFISH WAS MADE IN 1938 AT CHARLES ISLAND IN THE GALAPAGOS. THE POWERFUL FISH, WEIGHING 190 LBS. WAS STOPPED WITH A 30-THREAD LINE IN 22 MINUTES.



**STOPPED IN 7 SECONDS** TOM DOW KO'D NED KILEY IN THE SHORTEST BARE-KNUCKLE BOUT ON RECORD. IT HAPPENED ON JANUARY 4TH, 1868, AT LEAVENWORTH, KANS., IN THE DAYS WHEN A BOUT WAS OFTEN BROKEN UP BY THE SHERIFF OR POLICE.

## FAMOUS FOR SURE STOPS

AT ALL TIMES ARE JOHNS-MANVILLE INDUSTRIAL FRICTION MATERIALS. AVAILABLE IN A WIDE VARIETY OF FLEXIBLE AND RIGID STYLES, THESE

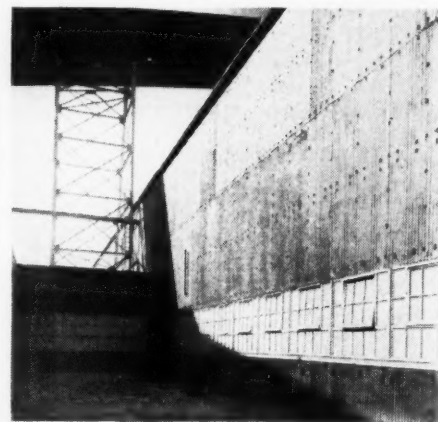
FRICTIONS "GO TO WORK" ON SWINGS, CROWDS, HOISTS AND BRAKES TO GIVE

YOU THE MAXIMUM CYCLES PER MINUTE ON YOUR EQUIPMENT. JOHNS-MANVILLE, BOX 290, NEW YORK 16, N. Y.

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INDUSTRIAL FRICTION MATERIALS



**PROTECTED METAL** for roofing and siding on industrial buildings, known as Plastipitch, consists of flat, corrugated or V-crimp steel sheets with surfaces and edges treated with special compound. Provides permanent adherence to metal at low as well as high atmospheric temperatures and



thoroughly protects base from rusting, corrosion, salt air and effects of chemical fumes. After Plastipitch coating, sheets are provided with additional surfaces to give added protection. Sheets can be easily fabricated without special equipment and can be bent without impairing coating because of toughness and elasticity.—**Tar & Chemical Division, Koppers Co., Inc., Pittsburgh 19, Pa.**

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**WELLPOINT  
SYSTEMS**

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**IT'S WHAT'S INSIDE**

*... that makes the man*

*Isaacson*

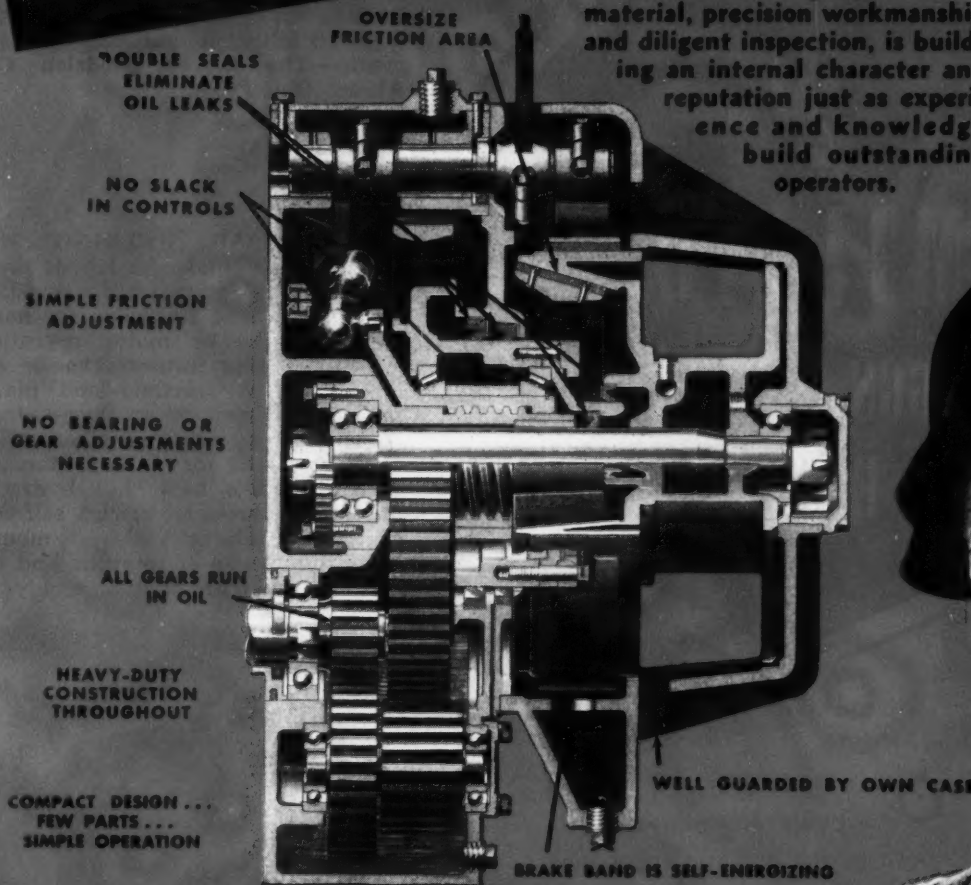
**KABLE POWER UNIT**

*... is like that, too!*



Modern basic design, plus tested material, precision workmanship and diligent inspection, is building an internal character and reputation just as experience and knowledge build outstanding operators.

The same internal character is built into either the single or double drum units—both are available for your tractor.



Isaacson Kable Power Unit is the secret of profitable, trouble-free cable operation. See your tractor dealer or write for further information.

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*Tractor Equipment*

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user, dealer and manufacturer of gasoline powered  
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*Air-Cooled Power*



**HAND FIRE EX-  
TINGUISHER** holds  
4 lb. of carbon di-  
oxide and comes  
with carrying han-  
dle and control but-  
ton designed for  
fast operation. It  
can be carried in  
one hand, with  
thumb operating  
control button.  
Horn swivel quick-  
ly raises or lowers  
as needed, remain-  
ing in lower posi-

tion when attached to wall rack  
furnished with each extinguisher, to-  
gether with quick release chain.  
Painted vivid orange and black for  
high visibility, it can be recharged  
ments.—The B. F. Goodrich Co.,  
Akron, Ohio

**BUTT-FLASH WELDING MA-  
CHINES** in five standard sizes range  
in electrical capacities from 20 to  
250 kva. Can be furnished for hand,  
air, hydraulic or motor operation.  
Work clamping fixtures can be op-  
erated by one method and platen  
traverse by same or another method.  
Machine may be manually controlled,  
semi-automatic or fully automatic.  
Larger models have full hydraulic  
operation through single self-con-  
tained hydraulic unit which is mount-  
ed within frame of machine and can  
be removed without disassembly for

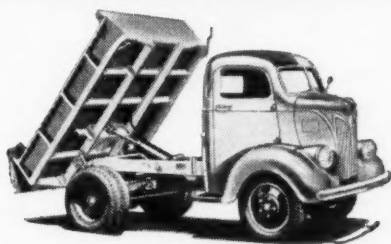


inspection or service. It contains  
three pumps: Rotor for platen tra-  
verse; gear-type for clamping work  
to electrodes; and piston to furnish  
pressure for upset action. Drive of  
pumps through high-load capacity  
cone-drive assures maximum power  
utilization through compact unit and  
long trouble-free life. Large, flat T-  
slotted platens are designed to ac-  
commodate wide range of standard-  
ized and/or special dies for holding  
virtually any size or shape work  
piece within capacity of machine.  
Hand wheels engaging screws mount-  
ed in sturdy C-frame back-up plates  
provide quick adjustment for work  
length.—Progressive Welder Co.,  
3050 E. Outer Drive, Detroit 12,  
Mich.

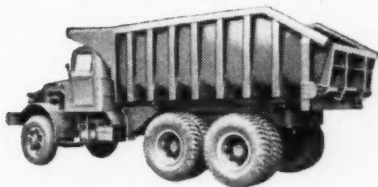
# The BEST COSTS LESS



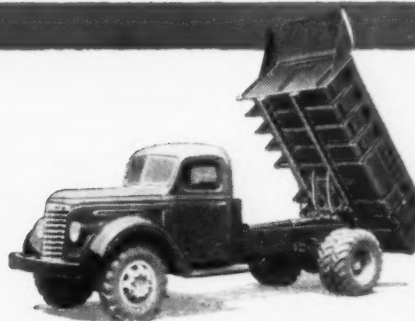
For years Gar Wood has consistently offered truck and trailer equipment of utmost utility and outstanding value. Leadership in this field resulted from this policy. Gar Wood equipment costs less in the long run because it is better built to give peak performance and lasting satisfaction.



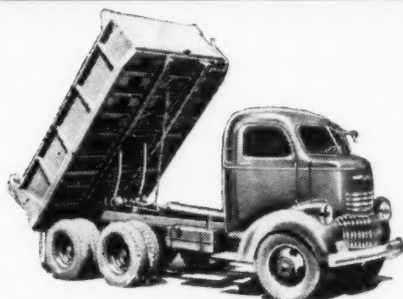
Type C12 Body and Model D6 or D7 Hoist. Dumping angle 55°.



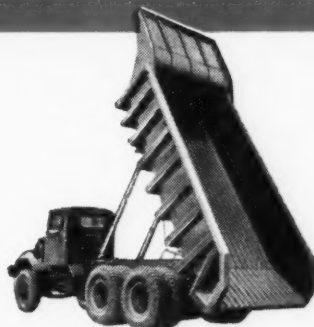
Type X-112 Extra heavy duty Body with automatic downfolding tailgate.



Special rock Body, scoop type rear end. Model F4CA cam and roller Hoist.



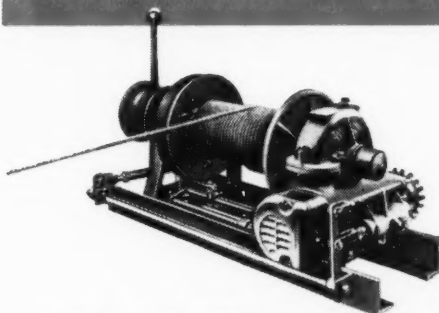
Type W12 Body. Model F4C cam and roller Hoist. Capacity 6 cu. yds.



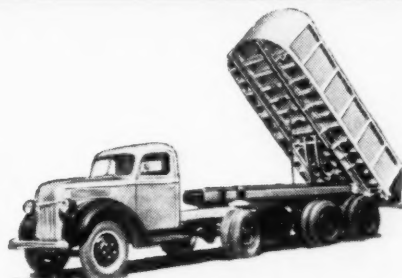
Type X-112 Extra heavy duty Body, scoop end, with Model T-4440 Hoist. Capacity 19 cu. yds.



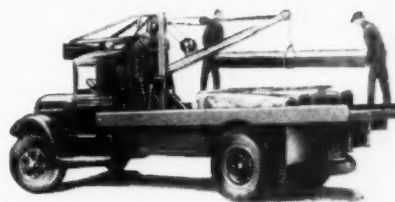
Type W12 Body, front recessed for Model TV83 Hoist. Capacity 15 cu. yds.



Rapid Reverse truck Winch. Single lever control. Capacities 15,000 to 60,000 pounds line pull.



West Coast Special W-12 Body, Model F8C cam and roller Hoist. Capacity 10 cu. yds.



Telescopic boom Crane. Radius 8 to 20 feet.



## GAR WOOD INDUSTRIES, INC.

7924 RIOPELLE ST.

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WORLD'S LARGEST MANUFACTURERS OF TRUCK AND TRAILER EQUIPMENT

OTHER PRODUCTS: • TRUCK TANKS • ROAD MACHINERY • HEATING EQUIPMENT • MOTOR BOATS



# Amsco Dippers Handle Record Volume of Sandstone and Shale

One of the nation's heaviest grading operations featured the construction of the Kanawha Airport at Charleston, West Virginia. This job involved the handling of 9,700,000 cubic yards of material. In the early stages, power shovels worked ledges which were 300 ft. or more above the lowest filling levels. The job averaged about 40% rock, consisting of three layers of sandstone, separated by shale beds.

The contracts held by Harrison Construction Co. for grading the runways posed a real test of skill and efficiency. Harrison's key policy was to use plenty of the most modern equipment, with which 1,800,000 cubic yards of material were moved between October, 1944, and June, 1945, despite a cold winter and wet spring.



A-518—Lorain 82 shovel with 2-yd. Amsco all-manganese-steel renewable lip dipper, loading blasted sandstone and shale at Kanawha Airport.

Seven 13 1/4 to 21 1/2-yd. power shovels worked at three or more ledge points on stone and shale. Shovels in this size range were chosen in preference to larger ones for greater flexibility in planning operations, easier transporting, and because they are easier on the handling equipment.

Handling blasted sandstone and shale in large volume imposed a heavy responsibility on the power

shovel dippers, as continuous operation was important. Out time for dipper repairs and replacements would have been extremely costly on this



A-513—2-yd. Amsco streamline welded type dipper bites into king sized chunks of sandstone on the Kanawha Airport job.

job. Impact shocks and abrasive wear from the material handled would have meant rapid destruction for dippers of ordinary steel.

Logically, manganese steel dippers were employed. The pictures show some of the 2-yd. Amsco dippers on Lorain 82 shovels at work on the Kanawha Airport. Made of "the toughest steel known," these dippers stand up for maximum periods in even the most abusive service.

Send for Bulletin 641-D.

**Joliette Steel Limited, Joliet, Quebec, Owned by American Brake Shoe Company, Produces and Sells Amsco Manganese Steel Castings in Canada.**

## AMSCO

Foundries at

Chicago Heights, Ill.; New Castle, Del.;

Denver, Colo.; Oakland, Calif.;

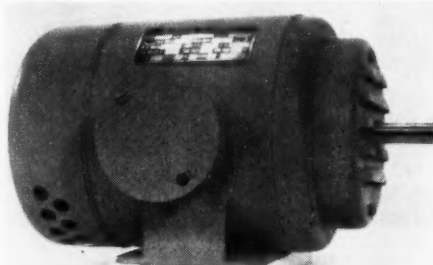
Los Angeles, Calif.; St. Louis, Mo.

Offices in Principal Cities

AMERICAN MANGANESE STEEL DIVISION  
CHICAGO HEIGHTS • ILLINOIS

AMERICAN  
**Brake Shoe**  
COMPANY

**DIRECT-CURRENT MOTOR** is rated at 1/2 hp. and has ampere input of 18. Available in sizes 1/3 and 1/4 hp., it is approximately 10 15/16 in. long, 7 3/32 in. high and 7 in. wide and weighs about 45 lb. Endbells are made of steel and frame is molded and welded. Drip-proof louvered cover is of drawn steel. Ball bearings have grease seals and are guaranteed to be sufficiently lubricated for life.



Louvered cover and commutator end cover can be rotated to permit mounting motor in any horizontal position and motor is drip proof when horizontally mounted. Brush holders are of stamped brass with adjustable tension arms. Brushes are large with surplus capacity. Commutator endbell is easily removable to permit inspection and adjustment of brushes and brush holders, which are mounted on bakelite insulating rings. Also available for 110 and 220 v.—Kato Engineering Co., Mankato, Minn.

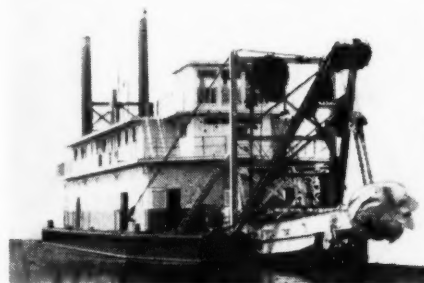
## ELLICOTT DREDGES

For sixty years, Ellicott dredges have been the standard. The NEW Ellicott catalog will be ready soon. It illustrates hydraulic pipe-line dredges, seagoing dredges, bucket-chain dredges, clam shell dredges and many special types.



SEND FOR YOUR COPY TODAY

ELLICOTT MACHINE CORPORATION  
Baltimore 30, Maryland, U. S. A.



# K... is for the knockout power in Sullivan Paving Breakers



## K 81... heavy weight

• Here's the paving breaker that will handle your toughest concrete demolition jobs — economically and efficiently. It breaks more concrete because it strikes more and heavier blows and because the operators find it easier to handle. Outstanding features of the K-81 include the exclusive Sullivan "Dual Valve," flat-sided cylinder for easy holding against operator's leg, replaceable chuck bushings, "U" type side rods and rugged cam-type retainer.



## K 61... medium weight

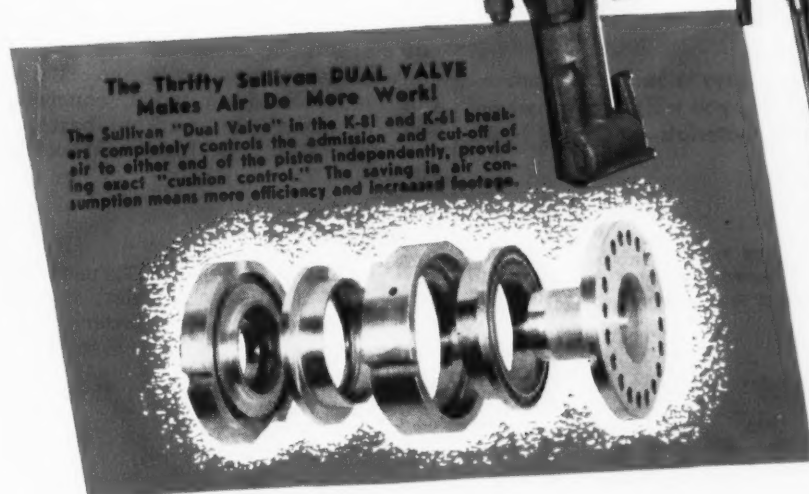
• This is the "younger brother" of the K-81 and is specially suited for thin section concrete and other light demolition jobs. It has the same hard-hitting, easy-handling characteristics but it is lighter in weight. Many of the parts, such as the interchangeable chuck housing, renewable chuck bushing and throttle, will fit both the K-61 and K-81 — which means a considerable saving in repair parts stock.



## K 9... light weight

• The K-9 is relatively small but is still a powerful breaker that is easy to handle. Its light weight makes it particularly useful in tunnel, trench or overhead work. Its low air consumption is a big advantage where air supply is limited.

Get the facts about these three paving breakers today. See your nearest Sullivan office or write for bulletins. Sullivan Machinery Company, Michigan City, Indiana. In Canada: Canadian Sullivan Machinery Co., Ltd., Dundas Ontario.



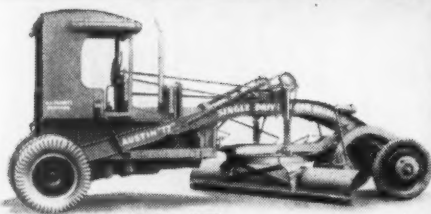
**PRODUCTS:**  
 Portable Compressors • Rock Drills • Wagon Drills • Core Drills • Portable Hoists • Paving Breakers • Trench Diggers • Sheet Pile Drivers • and other Pneumatic Tools

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## Thermoid — For Progress in Industry



← 1932 Austin-Western Motor Grader. The first Austin-Western Grader, equipped with Thermoid Hydraulic Hose, represented a distinct advance in road-building machinery.

→ Today's Austin-Western Motor Grader. Like every model in the past 14 years, the 1946 Austin-Western Motor Grader is equipped with Thermoid Hydraulic Hose.



Thermoid Powerflex Hydraulic Control Hose used on modern, heavier, more powerful Austin-Western Motor Graders is burst-tested to more than three times the pressure required fourteen years ago. And modern synthetics have solved the old bugbear, deterioration.

In factories, mills and quarries—Thermoid has contributed to industrial progress by manufacturing rubber products that can always be relied upon to do the job for which they were made—plus some more for safety. As engineers and designers evolve machinery to achieve bigger jobs, faster—they will continue to find Thermoid products ready for the new assignments.

Consultation with your Thermoid distributor may develop ways to help you improve processes and reduce costs. Like industrialists everywhere, you will find that when it comes to problems involving hose, belting or friction materials—it's good business to do business with Thermoid.

THE THERMOID LINE INCLUDES: Transmission Belting • V-Belts and Drives • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Sheet Packings • Industrial Brake Linings and Friction Products • Molded Hard Rubber Products.

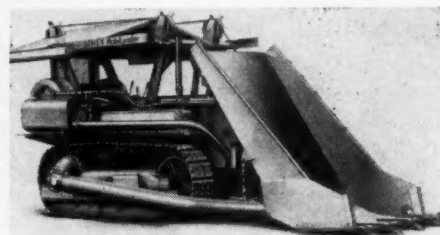
# Thermoid Rubber

DIVISION OF THERMOID COMPANY

TRENTON 6, NEW JERSEY

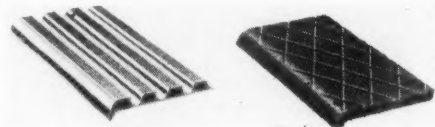
*Contributor to Industrial Advancement Since 1880*

**LOADER**, engineered for Caterpillar wide-gage D4 tractor, incorporates new and exclusive application of hydraulics with single finger tip control that results in instant response of



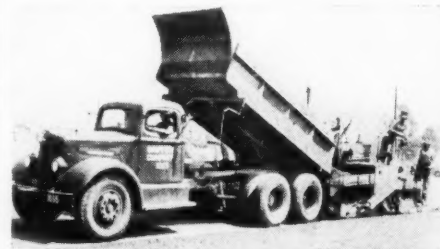
full power of tractor. Overhead loading principle is retained and new Model W5-5 has greater visibility and streamline mounting to permit full accessibility to tractor engine. Interchangeable bucket equipment is available in sizes for various types and weights of materials. Interchangeable bulldozer blade can be installed on lift arms.—Athey Products Corp., Chicago, Ill.

**ABRASIVE CAST SAFETY TREADS** are made of iron, aluminum, bronze or nickel in plain, cross-hatch or fluted patterns for use on stairs and ramps. Safe groove treads are made



of steel, yellow brass or white alloy bases with lead or abrasive grit fillers. Special formula impregnates grits in surface of tread and extends cross-hatch design to edge. Both types are readily applied to worn-out stairs, floor areas and walkways, as well as in new buildings. Units can be installed on wood, concrete, steel or sheet pan concrete bases.—Wooster Products, Inc., Wooster, Ohio.

**ASPHALT-LAYING UNIT**, used by Griffith Co., of Los Angeles, in airport construction, is powered by three-axle Model WA-26 White su-



per-power truck. Employing three men, it can spread asphalt at rate of 800 to 1600 tons a day, which is four times as fast as old hand-brake method.—The White Motor Co., Cleveland 1, Ohio.

*What  
it takes..*



## ..to Handle Heavy Tonnage

U·S·S AMERICAN TIGER BRAND is as strong, as tough and as tireless as wire rope comes.

Consider, for instance, the experience of the Bonneville Dam contractor who, by using TIGER BRAND haulage lines, button lines and hoist lines on his two cableways, delivered two times more tonnage of concrete than the rope previously used. The extraordinary part of this operation was that after these ropes were removed from the cableways and put into service on excavating shovels and draglines, they still gave 75% of the

life of ordinary new rope!

You can depend on TIGER BRAND to help reduce maintenance and replacement costs . . . to do a more efficient job in every operation requiring wire rope. See your supplier today. He has, or can quickly get, TIGER BRAND for you. And if you have any questions our wire rope experts will gladly work with you . . . without obligation.

LISTEN TO . . . the "Hour of Mystery" presented by United States Steel on the radio every Sunday evening. Consult your local newspaper for time and station.

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**COLUMBIA STEEL COMPANY, San Francisco**  
*Tennessee Coal, Iron & Railroad Company, Birmingham, Southern Distributors*  
*United States Steel Export Company, New York*

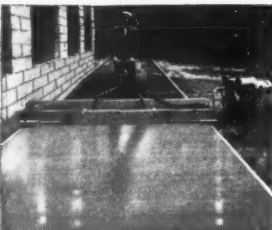
**UNITED STATES STEEL**



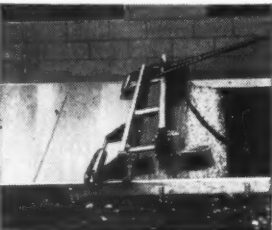
**U·S·S AMERICAN  
TIGER BRAND**

*Wire  
Rope*





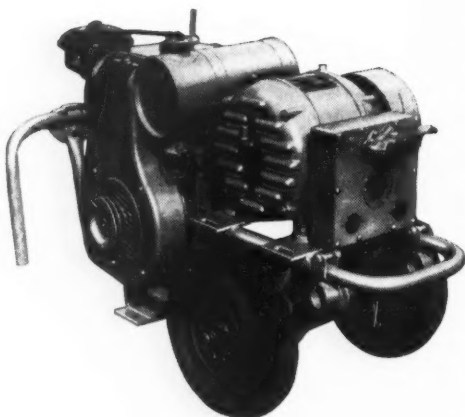
Forward movement requires little more than guidance on part of operator.



Tilted to make a second pass.

Here is, bar none, the most convenient, easy to handle, efficient and economical vibratory hand screed on the market today. One man operates it with ease — the vibratory impulses of the motor cause forward travel and little more than guidance is required. It will work right up to walls, is easily tilted and rolled back for second passes, and can be quickly adjusted over a range of nearly 4 feet without changing plank. Gives complete compaction through full depth of the slab and saves the cost of one man on the job. Model SC-11A — 13 ft. for 12 ft. section. Simple rugged 3 phase motor may be operated from commercial power. But, for a truly record-breaking combination use it with a

## JACKSON PORTABLE POWER PLANT

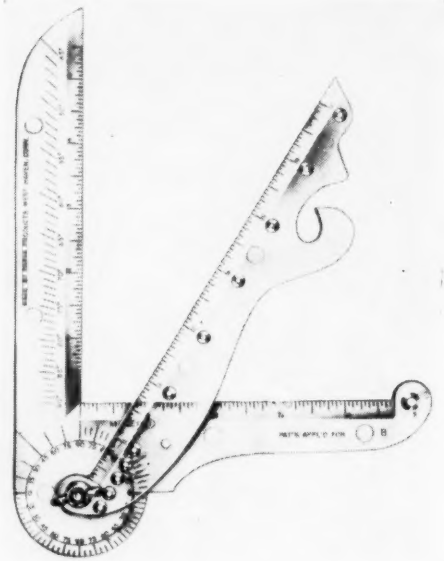


Powered by husky Wisconsin engines and equipped with new type permanent magnet generators which require no adjustment or maintenance, JACKSON Portable Power Plants give you reliable power when and where you want it. They permit instant adjustment of frequency for placing or finishing either highly workable or very dry mixes, and provide both 3 phase and single phase power for operating all types of electric vibrators, lights and construction tools. Available in capacities of 1.25, 2.5, 5.00 K.V.A., 115 Volt, 60 Cycle A.C. (Model M-2, 2.5 K.V.A., shown at the left.)

Write for complete information and name of nearest JACKSON distributor.

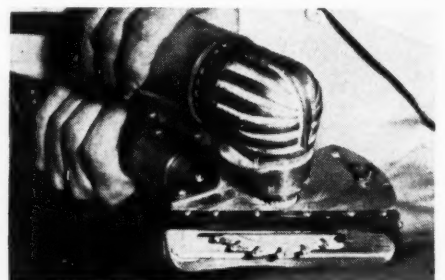
## ELECTRIC TAMPER & EQUIPMENT CO., LUDINGTON, MICH.

**DRAWING AND MEASURING DEVICE**, known as Parva-graph, is accurately designed and mathematically calibrated to serve as square, dividers, protractor, triangle, ruler, compass, french curve and miter. Con-



sists of two parts: Combination square and removable miter arm which can be mounted on square through either of two mounting holes. Wing nut locks miter arm at any desired position.—Parva Products Co., West Haven, Conn.

**PORTABLE "SAW"** with tungsten carbide teeth cuts precise channels in plaster walls to make possible modernization of apartment heating systems without costly restoration and



redcoration previously necessary. Tool, which inhales dust in its own vacuum cleaner, makes possible complete job of burying tubing, mounting thermostat and installing valve in less than an hour.—Minneapolis-Honeywell Regulator Co., 2753 Fourth, Minneapolis, Minn.

**CONCRETE MIXER**, with rated capacity of 11 cu. ft. of mixed concrete plus 10 percent, has tilted flow-line discharge chute, selective skip shaker and remixing drum. High-strength steel is used at all points of wear. It is furnished either on four wheels with side or end discharge or on two wheels with end discharge.—Kwik-Mix Co., Port Washington, Wis.



## PLEASANT DREAMS

Every state or county highway engineer . . . every superintendent of streets . . . every contractor . . . every airport maintenance manager . . . can rest contented in the fact that HUBER Road Machinery is the answer to his dreams of low maintenance costs—plus a minimum outlay for equipment to do the job.

The HUBER MAINTAINER—"the one-man maintenance crew" is 8 machines in one—a broom, mower, patch-roller, one-way or V-type

snowplow, bulldozer, scraper, and lift-loader.

The new 3-wheel HUBER ROAD ROLLER is a versatile machine that gets jobs done in a hurry. It is built in sizes from 5 to 14 tons.

And . . . there's a new HUBER TANDEM for every type of work . . . from 3 to 12 tons.

Make your plans to standardize on HUBER Road Machinery—and make sure your dreams of lowest possible maintenance costs come true.

THE **HUBER** MFG. COMPANY • MARION, OHIO, U. S. A.

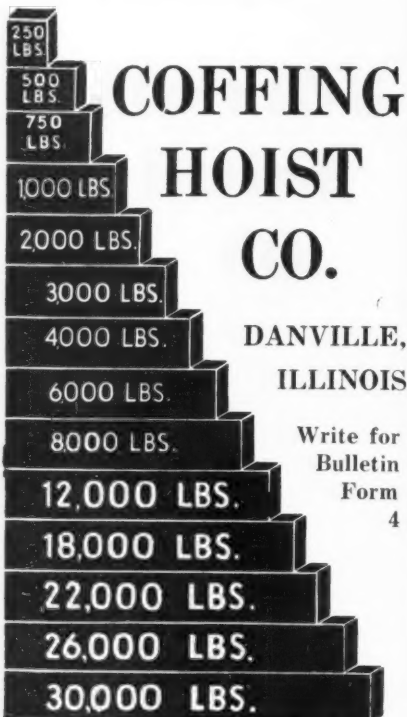
# HUBER ROAD ROLLERS MAINTAINERS



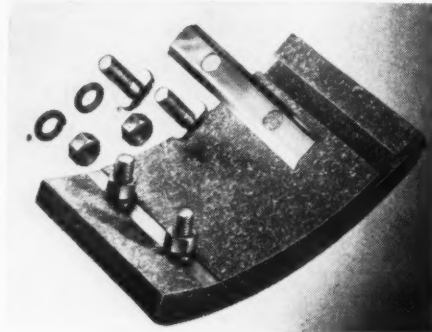
# COFFING HOISTS



**COFFING HOISTS** are built in a wide range of capacities. The **SAFETY-PULL Ratchet Lever Hoists** come in capacities from  $\frac{3}{4}$  to 15 tons. The **QUICK-LIFT Electric Hoist** is built in 28 different models with capacities ranging from 250 to 4000 pounds and the **MODEL Y-C Spur Geared Hoist** is built in seven capacities from  $\frac{1}{2}$  to 5 tons. As more materials become available more **COFFING HOISTS** will be built to meet your requirements. Contact your supplier for detailed information.

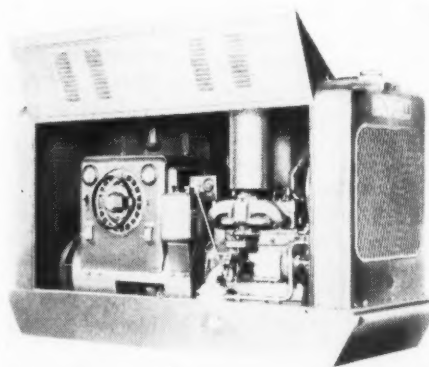


**HEAVY DUTY BRAKE BLOCK** slides into place instantly and does away with laborious bolting in relining. "Key-lok" blocks are made with lateral "fishtail" slots or keepers in which bolts are inserted, spaced to fit in brake bands. Keepers slide into fishtail slots cut into block and never need to be removed for relining. It



is necessary only to loosen keeper nuts slightly, slide off old blocks and on new ones tighten keepers and make normal adjustments. It also eliminates bolt holes which collect deposits of dirt and grit, increases friction surface and prevents scoring. Adaptable to both internal and external applications.—**The Raybestos Division, Raybestos-Manhattan, Inc., Bridgeport, Conn.**

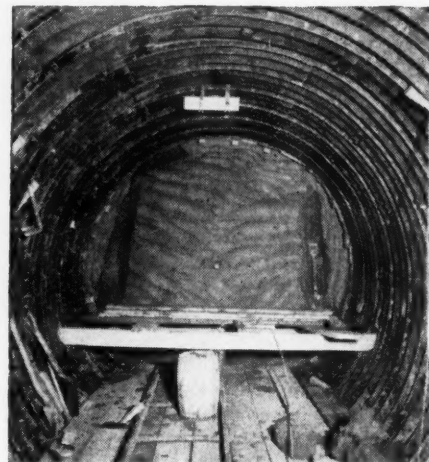
**ENGINE-DRIVEN ARC WELDER**, completely inclosed in compact steel canopy with hinged side panels and powered by sturdy 26-hp. four-cylinder engine, has wide range of 40 to 275 amp. Multi-range dual control of welding current makes it easy for operator to adjust voltage and amperage relationship to fine degrees. Wheel on front of generating control panel corresponds to station selector of modern radio receiver and volt-ampere adjuster located inside wheel corresponds to radio volume control. With 10 ranges of welding



current and 100 steps of volt-ampere adjustment in each range, it makes available 1,000 combinations of open-circuit voltage and welding current. Remote control allows adjuster to be easily removed from control panel for use with ordinary

(Continued on page 142)

# TRAFFIC MOVES WHILE YOU TUNNEL



You can forget about traffic delays and the hazards and inconvenience of open trenching when you use **ARMCO Tunnel Liner** to install conduits, sewers and similar structures. The work goes quickly and business above ground continues as usual.

Fast tunneling is the rule with **ARMCO Plates**. Even inexperienced crews can install them quickly. One man can easily handle the lightweight steel sections and bolt them together with regular wrenches.

With **ARMCO Plates** you buy *sinewy strength*—not bulky pounds. This means less excavation and storage requirements are smaller. You gain added safety and fire protection; while experience shows that **ARMCO Plates** cost less to carry a given load than any other type of tunnel liner.

Consider tunneling that next job with the aid of **ARMCO Tunnel Liner Plates**. The chances are you'll "hole through" ahead of schedule and under the estimate. Write today for complete facts. **Armco Drainage & Metal Products, Inc.**, and **Associated Companies**, 3065 Curtis Street, Middletown, Ohio.



**ARMCO  
TUNNEL LINER PLATES**



METAL PAINTED WITH  
**RED LEAD**  
GETS PLUS  
PROTECTION

## *Red Lead* "PASSIVATES" METAL *Stifles Rust*

Proven performance through the years won for Red Lead its wide acceptance by industry as the standard paint for protecting metal.

But it remained for modern research to show the reasons *why* Red Lead is such an effective guardian against rust. One of the most important of these is Red Lead's ability to keep iron and steel in a "passive" state, in which rusting activity is reduced to a minimum.

As is well known, bare, unprotected steel exposed to moisture rapidly rusts.

However, the same steel protected by Red Lead remains in a "passivated" or rust-inhibited condition.

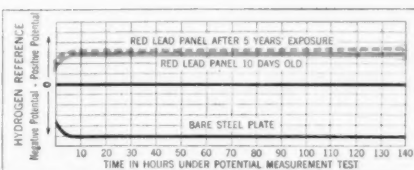
This non-corroding state of Red-Leaded steel, as compared with unprotected steel, can be measured electrically. See accompanying graph.

It is worth noting that, even after five years' exposure, the "passivating" power of Red Lead is still retained. No wonder, then, that Red Lead is considered the foremost paint for making metal *last*.

### Specify RED LEAD for All Metal Protective Paints

The value of Red Lead as a rust preventive is most fully realized in a paint where it is the only pigment used. However, its rust-resistant properties are so pronounced that it also improves any multiple pigment paint. No matter what price you pay, you'll get a better metal paint if it contains Red Lead.

Write for New Booklet—"Red Lead in Corrosion Resistant Paints" is an up-to-date, authoritative guide for those responsible for specifying and formulating paint for structural iron and steel.



### Scientific Proof of Red Lead's Protective Effect

In this test, a piece of unpainted steel was immersed in water. Iron, going into solution, reacted with oxygen in the water to form rust. This unrestrained corroding state is indicated by a rapidly developed and maintained negative potential relative to hydrogen (see above graph).

However, when steel panels painted with Red Lead were immersed under the same conditions, iron and lead salts formed directly next to the metal. This action at once stifled corrosion by preventing the iron from going into solution, thus keeping the steel surface passive. The result is shown in the graph curves above, where a quickly rising positive potential remains constant throughout the test.

It describes in detail the scientific reasons why Red Lead gives superior protection. It also includes typical specification formulas... ranging from Red Lead-Linseed Oil paints to Red Lead-Mixed Pigment-Varnish types. If you haven't received your copy, address nearest branch listed below.

\* \* \*

*The benefit of our extensive experience with Red Lead paints for both underwater and atmospheric use is available through our technical staff.*

**NATIONAL LEAD COMPANY:** New York 6; Buffalo 3; Chicago 80; Cincinnati 3; Cleveland 13; St. Louis 1; San Francisco 10; Boston 6, (National Lead Co. of Mass.); Philadelphia 7, (John T. Lewis & Bros. Co.); Pittsburgh 30, (National Lead Co. of Pa.); Charleston 25, W. Va. (Evans Lead Division).



**Dutch Boy**  
Reg. U. S. Pat. Off.  
**Red Lead**





## ***This name on a reel — means*** **TOUGH WIRE ROPE**

For rugged, long-lasting wire rope be sure it bears the name Wickwire Spencer. Every step in the making of Wickwire Rope is under constant, careful control, from the special formulae used in making the steel, through processing of the wire until it is exact within a fraction of a thousandth of an inch, through laying of the strands and final closing.

Order Wickwire Spencer Wire Rope and be assured of the utmost in performance, safety and long rope life. It is available in all sizes and constructions—both regular lay and WISSCOLAY *Preformed*.

### **HOW TO PROLONG ROPE LIFE AND LESSEN ROPE COSTS . . .**

Thousands of wire rope users—old hands and new—have found "Know Your Ropes" of inestimable value in lengthening life of wire rope. Contains 78 "right and wrong" illustrations, 41 wire rope life savers, 20 diagrams, tables, graphs and charts.

SEND FOR YOUR FREE COPY



*Send your wire rope questions to*

## **WICKWIRE SPENCER STEEL**



A DIVISION OF THE COLORADO FUEL AND IRON CORPORATION  
EXECUTIVE OFFICES—500 FIFTH AVENUE, NEW YORK 18, N. Y.

Abilene (Tex.) • Boston • Buffalo • Chattanooga • Chicago • Denver • Detroit  
Houston • Los Angeles • Philadelphia • San Francisco • Tulsa • Worcester

(Continued from page 140)

extension cord so operator can adjust welding heat right at work, eliminating repeated trips between welding work and machine. Standard equipment also includes mercury-type idling device which automatically idles engine when not in use. Stationary model has steel skid mounting, beveled at both ends with tubular and cross members for easy skidding. Portable mountings on two-wheel pneumatic-tired trailer or 16-in. shop-type wheels are also available—**The Hobart Bros. Co., Troy, Ohio.**

**HEAVY-DUTY TRUCK** has 215-in. wheelbase. Here R. M. BUZARD, western district manager (right),



congratulates A. W. ENGSTROM, works manager, as first "Western" model F-4064-H, on which oil well cementing equipment will be mounted, rolls off assembly line of company's Emeryville, Calif., works.—**International Harvester Co. Motor Truck Division, 180 N. Michigan Ave., Chicago 1, Ill.**

**ROCK BREAKER** is integral unit of specially treated steel operating in movable slides which expand in parallel lines contacting inner surface of drilled hole, resulting in immediate breakage. Direction of break can be controlled by placing tool in hole so that opening between two slides points in direction of required break, which will be comparatively clean. Boulder buster is made in 1½-in. size for 1½-in. hole. Steel shanks are available in following sizes: 7/8x3¼ in., 1x4¼ in., 1½x6 in., and 1¼x6 in. Company also produces drill steel guide to make one-man job safe; drill steel ejector; and special quarry and contractors' penetrating graphite oil.—**Universal Pneumatic Tool Co., 722 Chestnut St., St. Louis 1, Mo.**

# Insure Safe, Positive Lubrication with ALEMITE EQUIPMENT

● This new line of Alemite Equipment was developed specially for the construction industry. It's built rugged to take a beating, have long life and give uninterrupted operation.

There's a piece of Alemite Equipment for every purpose, to handle all types of lubricants in any temperature. You assure the proper handling and application of greases and oils, and eliminate contamination and waste.

It all adds up to longer life and greater efficiency for your machines.

Shown here is some of the equipment in the new line. For additional information, write Alemite, 1840 Diversey Parkway, Chicago 14, Illinois.



**ALEMITE LEVER GUNS**... equipped with a loader valve which permits rapid and positive refilling without need for disassembly... without mess or waste. High pressure (up to 10,000 lbs.) makes it possible to serve difficult bearings with the minimum of manual effort.



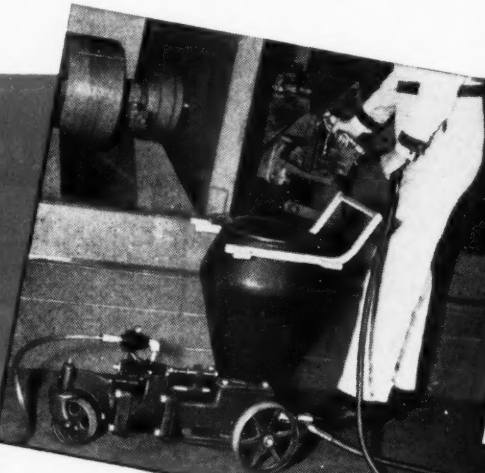
**ALEMITE LOADER PUMPS**... the one shown is used to fill hand guns from the original 100-lb. lubricant drum. (Also available in 35-lb. capacity container.) The loader prevents air pockets in the gun, which results when hand paddle methods are used. It ends waste and contamination of lubricants. It saves time, eliminates handling, is easy to operate.



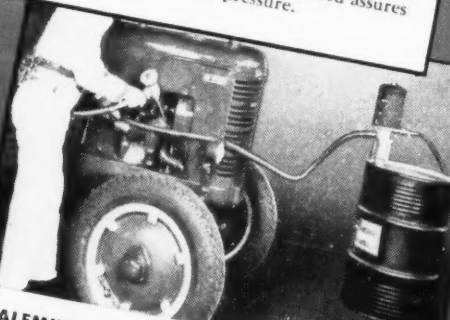
**ALEMITE VOLUME PUMPS**... Designed for track roller and idler bearing lubrication, and all points requiring a volume of lubrication. Pump has a capacity of 35 lbs. It develops 3500 lbs. pressure. Easily pumps all grades of light-bodied or semi-solid lubricants that seek their own level. Protects lubricant from dirt and moisture.



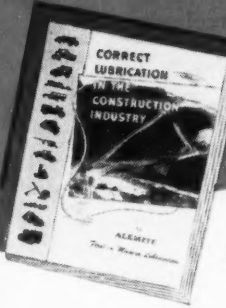
**ALEMITE TRANSFER PUMPS**... A clean, rapid method of handling petroleum products. Transfers oil, grease and other fluids from their original containers without mess or waste. The original containers remain sealed against dirt, moisture, and foreign particles.



**ALEMITE HIGH PRESSURE PUMPS**... These air operated pumps serve the heavy duty requirements of the construction industry for power lubrication when extensive lubrication needs make manual methods impractical. Handle a volume delivery of heavy fibrous lubricants even at low temperatures. Worm feed assures positive volume delivery at high pressure.



**ALEMITE AIR OPERATED OIL PUMPS**... fill the contractor's need for crankcase and gear case servicing equipment. They pump and dispense oils and other fluids directly from original 54 gallon drums. Eliminate handling and need for messy measuring equipment. Drums remain sealed against dirt, sand, and moisture.



## NEW FREE BOOKLET

"Correct Lubrication in the Construction Industry"

Contains valuable lubrication information—needs of many types of machines—proper selection of special lubricants... best methods of application... quick facts on various lubricants. Handy size to keep for ready reference. Send for your copy today.



# ALEMITE

Alemite ALONE Combines all 3 in Lubrication

1. EQUIPMENT 2. PROCEDURES 3. LUBRICANTS



# UNIT'S "Big 3"

Designed for **FASTER** and **EASIER OPER-  
ATION . . . where the Going is TOUGH!**

## UNIT 1020

$\frac{3}{4}$ -Yard Shovel



Here are three time-tested UNIT machines that continue to "make the headlines" because of their unusual speed, efficiency and all-around dependability. Check the following exclusive UNIT features: Compact, streamlined design . . . Straight line engine mounting . . . Drop forged alloy steel gears . . . Automatic traction brakes . . . Interchangeable disc type clutches . . . One-piece cast gear case . . . and above all, UNIT's safety-promoting **FULL VISION CAB**. No other excavator on the market has all these features.

**CONTACT FACTORY DIRECT**  
*for Price and Delivery*

# UNIT CRANE & SHOVEL CORP.

## UNIT 514

$\frac{1}{2}$ -Yard Dragline



**ALL Unit Models  
are Convertible to  
ALL Attachments**

## UNIT 357

5-Ton Mobile Crane with  
Magnet Attachment.



6305 W. BURNHAM ST.  
MILWAUKEE 14,  
WISCONSIN, U.S.A.

## NEWS FROM MANUFACTURERS

### About Their Products

The publications reviewed below, will keep you posted on latest developments in construction equipment and materials available for your use.



**101 USES FOR WROUGHT IRON** — (36-p. revised edition) Contains numerous photographs depicting utilization of wrought iron piping, bars and flat rolled products in bridge - building

and heavy construction industry. Among applications are bridge railings, decks, blast and brine plates, downspouts and conduit; piping systems for steam, hot and cold water, fire protection, gasoline, oil and air; inner pipes and casings for oil, water and gas wells, water tanks, smokestacks; coal chutes; tanks, snow melting and radiant heating systems, and other equipment and building material services where corrosive and fatigue conditions are encountered.—**A. M. Byers Co., 6th and Bingham Sts., Pittsburgh, Pa.**

**EARTHMOVERS**—(8-p. folder) Features Model F 15-ton rear-dump machine for off-highway hauling of earth, rock, ore and heavy excavation with struck measure capacity of 9.7 cu. yd. and top speed loaded of 22 mph. Another folder contains illustrations and specifications on 13-cu. yd. bottom-dump Euclid which has payload capacity of 40,000 lb. and maximum speed loaded of 26 mph.—**Euclid Road Machinery Co., Cleveland 17, Ohio.**

**COPPER ALLOY WELDING**—(32-p. handbook) Covers procedures and materials for welding and brazing of copper and copper alloys. Definitions of materials and processes are accompanied by table of compositions and properties of various alloys, followed by general information as to welding characteristics of these materials. Chart indicates how each of common copper alloy groups can be welded or brazed by several different methods and tells preferred materials to be used with each method.—**C. E. Phillips & Co., 2750 Poplar St., Detroit 8, Mich.**

# VIBER-ATE

## TOUGH POURS

### WITH VIBERS

**No Matter How  
Difficult the Job...**

You can vibrate concrete more effectively with VIBERS. Maximum full depth compaction is possible with great economy of time, because VIBERS are so easy to handle, so sturdily constructed—and give you the unmatched speed in concrete of 9,500 r. p. m., assuring uniformity of density and strength.

All VIBER units are interchangeable to give you the right combination for every job, with three choices of power—electric, air, gasoline. See your dealer now for immediate delivery, all models.

## VIBER

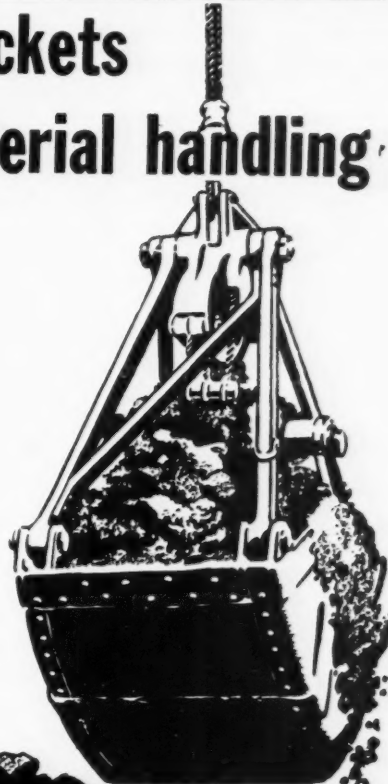
**SINCE 1931 COMPANY**

**726 SO. FLOWER STREET  
BURBANK, CALIFORNIA**

**ORIGINATORS OF INTERNAL CONCRETE VIBRATION**

## Brownhoist Buckets for faster material handling

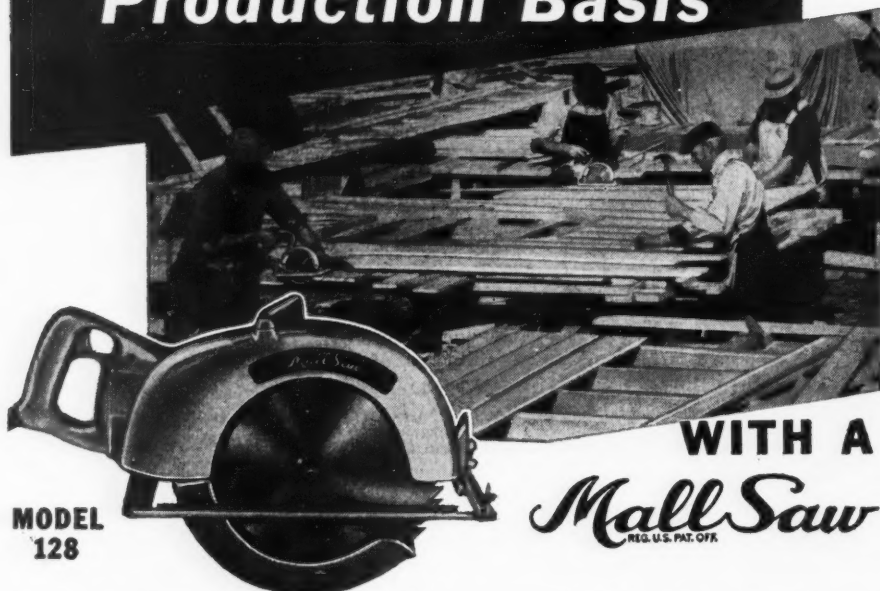
The deep-digging, hungry mouths of Brownhoist Clamshell buckets speed up the handling of coal, ore, gravel, dirt, cinders, clay, etc. Large sheaves reduce rope wear and maintenance. Sturdy construction and latest design insures long life. Available in rope-reeve, power-wheel and link type. Industrial Brownhoist Corporation, Bay City, Michigan. Offices in New York City, Philadelphia, Pittsburgh, Cleveland and Chicago.



**BROWNHOIST BUCKETS GIVE MORE  
YEARS OF TROUBLE-FREE PERFORMANCE**



## Put Sawing on a Production Basis



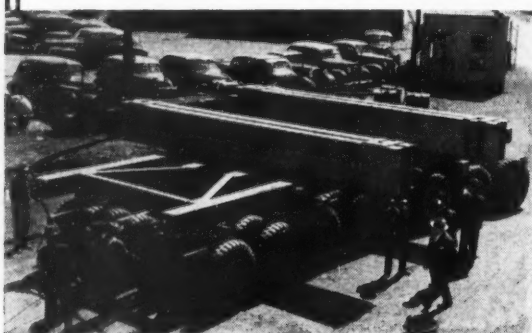
To gain the economy and speed of mass production on construction jobs—use a MallSaw. One cut assures a clean, square board end . . . reduces fitting time . . . takes fatigue out of sawing. Multiple cutting of like members speeds framing and form construction . . . saves lumber. A MallSaw can be used for cross-cutting, ripping, and bevel cutting to 45°. Also operates on abrasive wheel for cutting non-ferrous metals, cutting and scoring tile, stone and concrete. Equipped with sawdust blower and safety guard. Model 128 has 12" blade and 4½" capacity. Available for 110-volt AC-DC or 220-volt AC-DC. Furnished in all-metal carrying case. Also Pneumatic models.

Ask Your Distributor or Write Direct for Literature and Prices.

**MALL TOOL COMPANY, 7757 South Chicago Avenue, Chicago 19, Ill.**

★ 25 Years of "Better Tools For Better Work"

## so-they went to **ROGERS**



Above trailer with actual 600 ton capacity, was built for Eichleay Engineering Corp., and sold by Atlas Equipment Co., both of Pittsburgh, Pa.

*for the*  
**WORLD'S  
GREATEST  
TRAILER**



**EXPERIENCE**  
builds 'em  
**PERFORMANCE**  
sells 'em

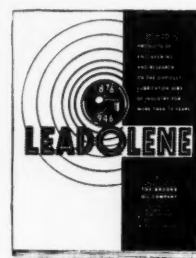
and to the solution of their problem of transporting a 300 ton burden in conjunction with a SECRET military test. In the face of unprecedented problems, Rogers designed, built and delivered in 30 days, a trailer 39 feet long and 17 feet wide.

Sixty-four 14.00"x 27" tires, mounted in banks of eight on axle units, permitted full oscillation, conforming with uneven desert terrain and equal load distribution over all tires.

**ROGERS BROTHERS CORP.**

220 ORCHARD ST., ALBION, PENNA.

**BLACK AND WHITE PRINTS**—(4-p. folder) Suggests advantages of black and white direct printing process, which include ease of reading, checking, filing and mailing. Medium, light and card-weight paper prints are available, as well as prints with colored lines on white background or black or colored lines on green tinted background. Eradicators will remove lines or transform black to red lines on BW prints.—**Charles Bruning Co., Inc., 4754 Montrose Ave., Chicago 41, Ill.**



**LUBRICANT** — (12-p. bulletin) Furnishes detailed information on "I.P." Leadolene, indestructible film lubricant with high degree of adhesiveness. It is water repellent, is not easily emulsi-

fied and retains its stability in service and in storage. Ten outstanding examples of product's success in actual industrial use are shown.—**Brooks Oil Co., 315 E. Carson St., Pittsburgh 19, Pa.**

**MAINTENANCE MANUAL AND PARTS CATALOG** — (32 pp., illustrated) Covers Model 5 trailer with single-axle underconstruction, featuring Multi-Rate spring suspension. One of series to be issued covering complete line, it contains section on safety of operation with detailed instructions on use and care of operating equipment; helpful suggestions for preventive maintenance; guide for trouble-shooting; lubrication charts; and disassembly drawings showing parts and numbers. It is designed to provide self-service instructions for minor repairs or adjustments that may be performed without aid of special tools or trained personnel.—**Fruehauf Trailer Co., Detroit 32, Mich.**

**SHOVEL, CRANE AND DRAGLINE** — (20-p. bulletin) Features application of "Precision" air control for Model 1201, an advantage which results in minimum fatigue, fewer delays and greater efficiency. Contains pictures of complete machinery and views showing machine in wide variety of jobs. As shovel, it has capacity of 3½ cu. yd., as crane 65 tons, and as dragline variable.—**Shovel & Crane Division, Lima Locomotive Works, Inc., Lima, Ohio.**

PART OF A \$100,000,000 PROJECT **DUG "IN THE DRY"**  
**with a MORETRENCH WELLPOINT SYSTEM**



*Research Laboratory Foundation, Whiting, Indiana  
 Contractor: Gust K. Newberg Const. Co., Chicago, Illinois*

**PROBLEM:**

To excavate 20' in fine sand and silt for a building foundation—with 17' of water for a handicap.

**SOLUTION!**

Call MORETRENCH—experts at wringing out wet ones with speed and efficiency.

**RESULTS?**

Immediate! And Bone Dry! Sheet piling eliminated. Construction done in perfect safety. Time and money saved.

Your wet work can be handled just as easily, just as efficiently. Moretrench has the equipment, the personnel, and the experience to guarantee results on any job.

## **MORETRENCH CORPORATION**

90 WEST STREET, NEW YORK 6  
 ROCKAWAY, NEW JERSEY

HOUSTON 8, TEX.  
 315 W. 25th St.

TAMPA 6, FLA.  
 2424 Chicago Ave.

CHICAGO 23, ILL.  
 3037 So. Christiana Ave.



## LUFKIN X-46 Folding Wood Rule

▲ with 6"  
brass  
extension

For general measuring work the Lufkin X-46 Folding wood Rule is almost as handy as an extra pair of hands.

Made of selected hardwood, finished in light color which makes perfect background for black, prominent markings. Brass extension slide permits inside measurement. For a handy, durable folding wood rule, buy the Lufkin X-46 from your dealer. Write for free catalog. THE LUFKIN RULE CO., SAGINAW, MICHIGAN, New York City.



FOR DEPENDABILITY

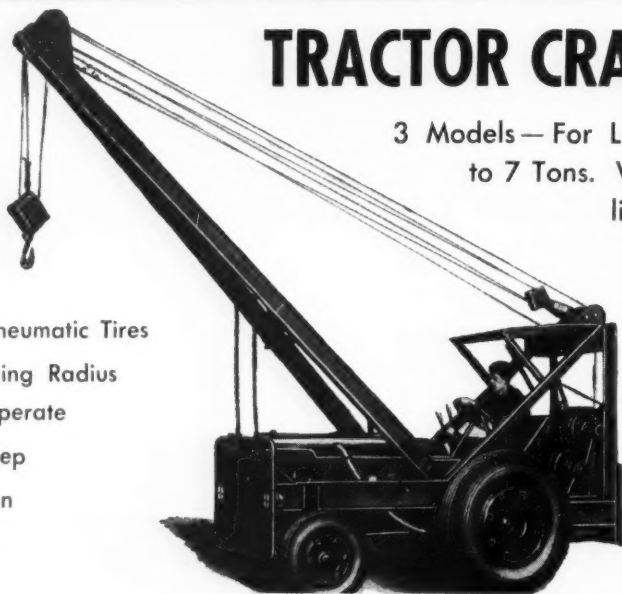
# MERCER

"The Name that Carries Weight"  
MATERIAL HANDLING EQUIPMENT

## TRACTOR CRANES

3 Models—For Loads Up to 7 Tons. Write for literature.

Solid or Pneumatic Tires  
Short Turning Radius  
Easy to Operate  
Low Up-Keep  
Clear Vision  
Live Boom



MERCER ENGINEERING WORKS, INC.

Plant: Clifton, N. J.

SALES REPRESENTATIVE

MERCER-ROBINSON COMPANY, INC.  
30 CHURCH ST., NEW YORK 7, N. Y.

**LEVER, SCREW AND HYDRAULIC JACKS**—(64-p. pocket-size catalog) Pictures and describes hundreds of jacks of conventional and special types in sizes from 3- to 100-ton capacity with specifications. Included are several items which were not produced in wartime and are again available. Also shown are recent additions to Simplex line, including 30- and 50-ton hydraulic jacks for heavy lifting and new track shifter which provides labor-saving method of lining railroad track. Feature pages show jacks in various applications. Two indexes show jacks by types and numbers respectively. — Templeton, Kenly & Co., Chicago 44, Ill.



**ROOFING AND SIDING MATERIAL**—(Illustrated circular) Describes Plasticlad, alloy-steel, electrostatically coated material. Extraordinary toughness of copolymer resin coat, immunity to at-

mospheric corrosion or chemical attack, and high fire resistance are among merits claimed. Attractive colors, permanently incorporated in plastic coat, are offered.—Reliance Steel Products Co., McKeesport, Pa.

**SUPPLY TANKS**—(Illustrated folder) Pictures and describes Models 102 and 103 for transporting supply of hot or cold materials to pressure distributor. Both models are furnished with or without heating systems and made by frameless construction method which does not require frame or chassis. Special truck mounted semi-trailer or four-wheel trailer models can also be had.—Littleford Bros., Inc., 457 E. Pearl St., Cincinnati 2, Ohio.

**INDUSTRIAL FLOORING**—(8 pp., illustrated) Describes "Emeri-Crete", heavy-duty, nonskid, non-absorbent, acid-resistant flooring made with Cortland aggregate of 100 percent selected emery with cement and water added. Comparative strength analyses of popular flooring materials used in plants and warehouses are charted in this booklet. It contains numerous installation photos and user experiences. Properties of product are presented by means of scientific tests, detail facts, photographs in use and thorough explanation of properties of aggregate.—Walter Maguire Co., Inc., 330 W. 42nd St., New York 18, N. Y.

**LIKE A CHAMPION FENCER**



## **FORM-SET ROPE**

*IS Relaxed*

**S**tudy the fencer's movements. Watch him in action. He's graceful, agile, light on his feet. Muscles flow freely. There's nothing about him suggestive of tension. He's learned to *relax* while engaged in a contest of skill and endurance.

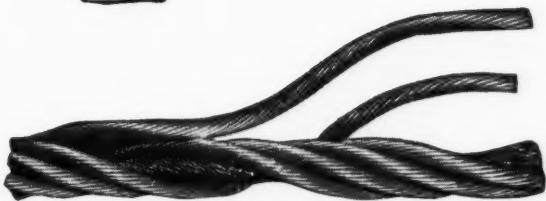
In Bethlehem's Form-Set rope, you'll find much of that same relaxed effect—a quality that pays heavy dividends.

Every wire and strand of Form-Set rope is pre-formed into a permanent helical shape before being laid in the rope. This means that the inner tension has been eliminated. The wires and strands have no tendency to "fight themselves" or each other.

You can prove this simply by cutting a section of Form-Set, leaving it unseized. Each and every wire lies just as it was. No bushing—no flying apart—for the wires and strands are *relaxed*.

What does this mean? For one thing, easier handling. More important, though, is the longer life that often results when the rope is subjected to sharp turns and bends—reverse bends, for instance.

All grades, sizes, and types of Bethlehem wire rope can be obtained with the Form-Set construction. Ask the nearest Bethlehem office or distributor to tell you more about it.

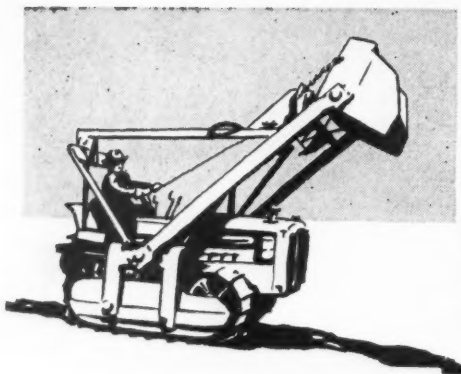


Here is a piece of "relaxed" wire rope. Even when cut or broken, the Form-Set wires and strands lie calmly in place. No tension at all—yet the toughness remains.

**When you think WIRE ROPE . . . think BETHLEHEM**







## Speed-Up and Simplify Equipment Cleaning with Oakite Composition No. 92

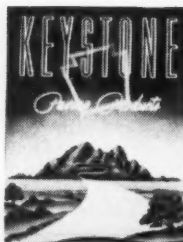
Want to speed up cleaning of your greasy muck-encrusted road and street building and excavating equipment? If so, it will pay you to try the Oakite Solution-Lifting Steam Gun charged with that new, specially designed, fast-working detergent OAKITE COMPOSITION NO. 92.

One of the outstanding features of this material is its ability to sequester lime and magnesium in hard water to prevent clogging of coils when used in steam generating equipment. Oakite Composition No. 92 is particularly effective for removing tenacious heavy mineral greases and asphaltic soils. Applied as recommended, Oakite Composition No. 92 is extremely economical to use . . . a little goes a long way. Oakite Composition No. 92 rinses freely from all surfaces.

Special Service Report giving complete details will be mailed promptly on letterhead request. Write for your **FREE** copy **TODAY!**

**OAKITE PRODUCTS, INC.**  
248 Thames Street, New York 6, N. Y.  
Technical Service Representatives Located in All  
Principal Cities of the United States and Canada

**OAKITE** *Specialized*  
**CLEANING**



**PAVING PRODUCTS**—(Two-color, 20-p. catalog) Lists and illustrates company's complete line of paving joints, sealing compounds, concrete curing compounds and sewer joint compounds. Engineering designs and specifications are featured. Joints covered include asphalt mastic board longitudinal and transverse tongue and groove joint; asphalt mastic board dummy joint; fiber expansion joint; and premolded asphalt expansion joint. — **Keystone Asphalt Products Co., 43 E. Ohio St., Chicago 11, Ill.**

**COPPER TUBE FOR RADIANT HEATING** — (75-p. brochure) Gives plumbing, heating and building trades information on theory, broad principles and advantages of radiant heating and practical problems involved in its installation. Sections cover: Theory and application; technical and design; and copper radiant heated structures. Mills, factories and warehouses are listed.—**Chase Brass & Copper Co., Inc., Waterbury 91, Conn.**

## RAPID!



Junior Model with Horizontal Frame Attachment.

Will break 15 inch reinforced concrete walls up to 10 feet high. Frame attachment can be removed and boom tipped up to vertical position for breaking all types of pavement.

Ask about our  
**HEAVY-DUTY TYPE**

**RAPID PAVEMENT BREAKER  
COMPANY**

1517 Santa Fe Ave. Los Angeles 21, Calif.

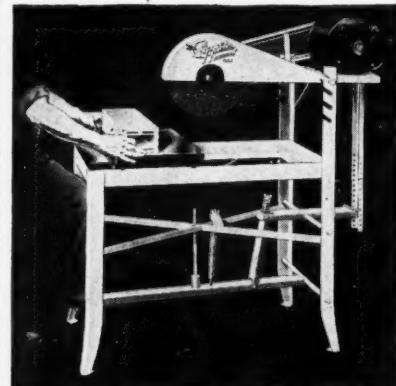


## FASTER CUTTING

...with

### Clipper Masonry Saws

Your Special Size and Shape Brick or Concrete Block can now be "Tailor-Made" at a moment's notice!



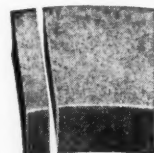
The new Clipper Multiple Cutting Principle makes possible faster cutting of every masonry material regardless of hardness.

Here are a few typical examples of the speed and accuracy with which concrete products and fire brick can be cut.



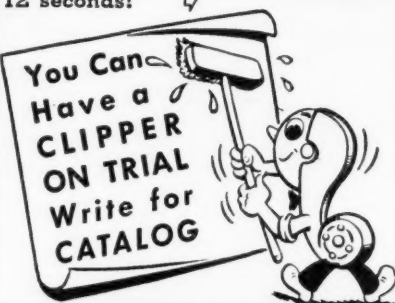
◊ This concrete block, converted into a special size, was cut completely in two in 19 seconds.

One of the many intricate cuts performed on first quality clay brick for heat treating furnaces—made in 8 sec. ◊



◊ Rotary Kiln Blocks, cut to size for "key" bricks in rotary kilns, require only 10 sec. for completion of cut.

Basic refractories for steel furnaces or cement kilns must be accurately installed. This magnesite brick was cut in 12 seconds! ◊



**CLIPPER MFG. COMPANY**  
4035 Manchester, St. Louis 10, Mo.

## NEWS OF EQUIPMENT MEN



**Charles W. Perelle** has been elected president of Gar Wood Industries, Inc., Detroit, Mich. He was formerly vice-president in charge of manufacturing of Consolidated - Vultee

Aircraft Corp. and vice-president of Hughes Tool Co.

**Howard R. Meeker** has been elected president of J. D. Adams Mfg. Co., Indianapolis, Ind., succeeding **Roy F. Adams**, who retains the office of chairman of the board. Mr. Meeker entered the Adams organization in 1913 and served successively as factory manager, division sales manager, general sales manager and executive vice-president.

**Appointment of R. J. Mahon** as general sales manager and **J. G. West** as assistant general sales manager has been announced by the Lone Star Cement Corp., of New York City.

**Carl E. Nagel** has been appointed manager of Editorial Service, Westinghouse Electric Corp., Pittsburgh, Pa. Mr. Nagel, who will be responsible for technical and trade articles, joined the Editorial Service in 1941 and was granted a leave of absence in 1943 to enter the U. S. Navy.

**Ferdinand W. Roebling, 3rd** (left) has been appointed vice-president in charge of engineering for John A. Roebling's Sons Co., Trenton, N. J.



He recently returned to the company after 5 years with the U. S. Army Engineers, where he held the rank of lieutenant colonel. He succeeds **Charles M. Jones** (right), who has become vice-president in charge of public and industrial relations.

## ALL IN THE DAY'S WORK FOR *Republic Water Hose*

**R**OUGH HANDLING, buffeting, crushing, dragging on construction jobs are all in the day's work to extra-tough Republic Water Hose Brands. Engineered for vastly more than the primary job of conducting water under required pressures, these advanced hose structures are built with surplus strength in reinforcements, with resistance to all forms of extraneous abuse in carcass and cover. The extra margin of serviceability that results has given Republic Water Hose enviable acceptance among contractors everywhere. Call your nearby Republic Distributor on your next water hose requirements, or for top performance in suction, air and other special types of hose for all purposes.



*Follow the Leader  
FOR BEST RESULTS*

# WELLMAN BUCKETS

*Williams Type*

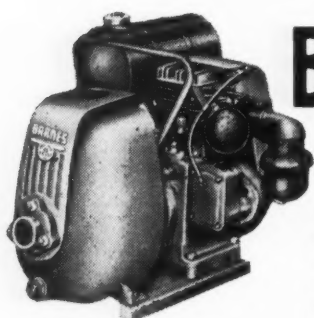
- The bucket leader is Wellman — pioneer in building buckets of welded rolled steel! Gives you longer, better service at lower cost on all types: Multiple Rope, Power Arm, Dragline, Power Wheel.
- Special Service —  $\frac{3}{8}$  to  $16\frac{1}{2}$  yd. capacity.

SEND FOR BULLETIN

THE WELLMAN ENGINEERING COMPANY  
7017 CENTRAL AVENUE • CLEVELAND 4, OHIO



# YOU CAN DO THE JOB BETTER—FASTER—CHEAPER



**NO WAITING!  
NO DELAY!**

Stock Shipment  
on This Pump!

## with Barnes Automatics

*The "33,000 for 1" Pump*

Put Barnes Automatic Centrifugal Pumps to work on a hundred and one different jobs around construction, building, and road projects, and you will do your pumping better, faster, and cheaper.

For Barnes Pumps are the "33,000 for 1" Pumps. They deliver not 1,000!—not 10,000!—but 33,000 gallons of water for one gallon of gas used! That's economy of operation. They have stepped-up capacities. That's faster delivery. They are lighter in weight. That's better and easier handling. And they are built to stand the gaff.

Remember these better Barnes "33,000 for 1" Pumps when ordering or specifying portable, self-priming centrifugal pumps.

Complete line of pumps ranges in size from 3,000 gallons per hour to 90,000 gallons per hour.

For sale by leading distributors in all principal cities. If there is no distributor near you, write, phone or wire.



**BARNES MANUFACTURING CO.**

*Quality Pump Manufacturers for 50 Years*

MANSFIELD, OHIO



*Waiting  
WORTH FIGHTING FOR!*



**"I realize those husky Sterling Wheelbarrows are not available today for immediate shipment — but they are certainly worth waiting for."**

Men naturally prefer Sterlings because of their well-balanced construction and easy wheeling qualities. Sterlings speed up the material-transport job . . . make it possible to haul many additional loads each day. Right now, the demand for Sterlings greatly exceeds the supply. However, deliveries of tubular framed barrows are being stepped up as rapidly as conditions permit.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

**Sterling**  
WHEELBARROWS



Look for this Mark of  
STERLING Quality

Installment portfolio of Credit Utility Co., Inc., has been acquired by C.I.T. Corp., of New York, according to a joint announcement by **Arthur O. Dietz**, C.I.T. president, and **Saul Gottesman**, president of Credit Utility. The C.I.T. Corp., which specializes in financing installment sales in the machinery and construction equipment fields, will take over servicing of all former Credit Utility Co. accounts.



**Retirement of Carl O. Wold**, vice-president of Caterpillar Tractor Co., Peoria, Ill., ends 40 years of service in the heavy construction machinery industry. He was executive head of

the Russell Grader Mfg. Co. prior to its acquisition by Caterpillar in 1928. He has been a director of the American Road Builders Association for many years.

**Pemco Corp.**, of Baltimore, Md., has announced the appointment of **Howard N. Williams** as sales promotion manager. During the war he was associated with the Navy Department as a field engineer and the Glenn L. Martin Co. as chief of its instrument laboratory doing research and experimental work for the government.

**New sales manager** of Sika Chemical Corp., Passaic, N. J., is **E. J. Peck**, former sales manager of Hilty Forster Lumber Co., Milwaukee, Wis.

**C. W. Pendock**, president, LeRoi Co., Milwaukee, Wis. has announced the formation of the Cleveland Division to produce a complete line of rock drills and related pneumatic equipment to complement the company's line of portable compressors. **Russell R. Morgan**, a former officer of the Cleveland Rock Drill Co., heads the new division. In addition to rock drills, the new line of LeRoi compressed air tools (to be available early in 1947) will include concrete breakers (with pile-driving and spike-driving attachments), clay spades, back-full tampers, sump pumps and wagon drills. Accessories will include air and water hose, couplings, clamps, manifolds, throttle valves, filters and line oilers. The new tools will be produced in a modern plant located in Cleveland, Ohio. The LeRoi Co. operations in Ohio will also include its Centaur Division at Greenwich where portable air compressors are manufactured.

# ROCK or GRAVEL

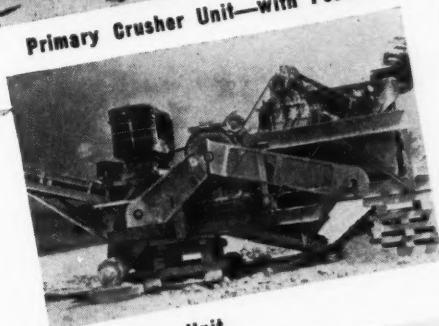
## crushed . . . sized . . . washed

to fit any specification from rip rap stone to agstone

### Cedarapids UNITIZED PLANT



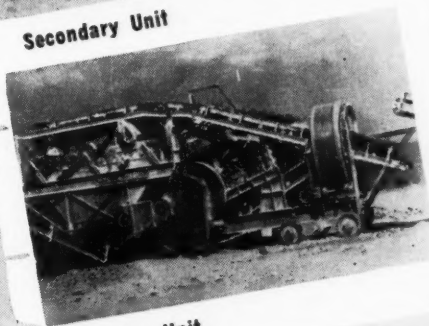
Primary Crusher Unit—with Feeder



Secondary Unit

For crushed stone when medium sized stone has to be reduced to 1½" — and a certain size is to be scalped out. Use Units 2 and 3.

For crushed gravel. Use Unit 3 alone.



Scalping Unit

For washed gravel. Use Units 3 and 4.



Washing & Sizing Unit

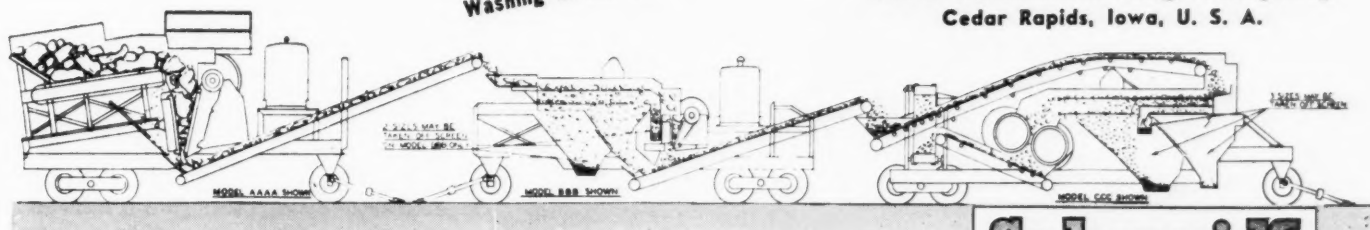
For crushed stone when big stone has to be reduced to 1½" — and a certain size is to be scalped out. Use Units 1, 2 and 3.

Complete Crushing, Screening and Washing Plant. Use Units 1, 2, 3 and 4.

For crushed stone when finer sizes are not required — 25" rock down to 1½". Use Units 1 and 3.

Each element of the Cedarapids Unitized Plant is a complete unit in itself balanced for high capacity and low cost, used alone or in any one of dozens of different combinations of matched units. You can start with a tandem straightline secondary plant and produce crushed gravel and add the other units as your demands increase. You can use a roll crusher, cone crusher, twin jaw crusher or Hammermill in the Secondary Unit. Each unit is portable so you can move just the equipment needed to do any particular job. Get the complete story from your nearest Cedarapids distributor. There's a size and type to fit every production requirement both as to volume and finished products. When buying a crushing plant—buy the best—buy Cedarapids.

**Iowa Manufacturing Company**  
Cedar Rapids, Iowa, U. S. A.



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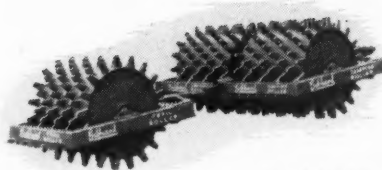
STRAIGHT LINE ROCK AND GRAVEL PLANTS  
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## The **GEBHARD** Tamping Roller



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Bearing Pressure  
empty 425 pounds per  
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**Appointment of William I. Burt** as vice-president, manufacturing, and **Dr. Frank K. Schoenfeld** as vice-president, technical, has been announced by the B. F. Goodrich Chemical Co., of Cleveland. Mr. Burt was formerly general manager of plants and Dr. Schoenfeld was technical director. Both have been with the company since 1927.



**New manager of manufacturers' sales** for The Goodyear Tire & Rubber Co.'s western division, at Los Angeles, is **E. T. Rainey**, former Seattle district manager of the

Aviation Products Division. He will be assisted by **R. E. Bolton** and **William van Amerongen**.

★ ★ ★

## BRITISH HOUSING

(Continued from page 85)

a mansion with 6 acres of gardens and a paddock of 7½ acres, will remain as a community center. Other London County Council plans include cottage estates at Chislehurst, in Kent, and Chessington, Surrey. On the former, 3,500 homes will be built on 495 acres; on the latter, between 6,000 and 7,000 cottages on 800 acres. At Harrow, they are erecting 1,114 prefabs., of which 502 will be permanent, semi-detached, three-bedroom buildings.

### Plans for Immediate Housing

These are the big projects. Meanwhile, the daily drive to provide immediate homes goes on. The nation-wide plan includes the building of permanent houses (mostly of the three-bedroom variety); the erection of temporary houses (of the single-story, two-bedroom type); the repairing and adapting of existing buildings and the requisitioning of empty houses; the conversion, where practicable, of wartime hutments and hostels for use as temporary dwellings, and the fullest employment of occupied houses, by voluntary sharing.

The London County Council two-  
(Continued on page 156)

# Supremacy!

PAGE Automatic Buckets automatically rock or roll right into digging position. This *automatic* action speeds up operation and makes any drag-line produce more yardage! That's why PAGE Automatics are preferred by dragline operators.

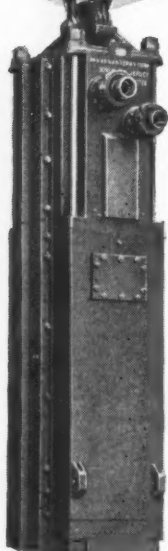


# PAGE

ENGINEERING COMPANY  
CHICAGO 38, ILLINOIS



# McKiernan-Terry SINGLE-ACTING PILE HAMMERS



Hammer mechanism completely enclosed—no exposed working parts.

**O**n jobs involving penetration of stiff blue clay, heavy "gumbo",

incipient shale, hard pan, compacted gravel or similarly dense substances, or where preformed concrete or other heavy mass piles are to be driven, McKiernan-Terry Single-Acting Pile Hammers provide heavy blows at low striking velocity, to overcome inertia and friction without excessive strain on the piling or wear on ram and anvil block. The **ONLY** single-acting hammer that will operate under water. Five standard sizes.

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Gives full information, specifications, photos, diagrams. Write for Bulletin 57.



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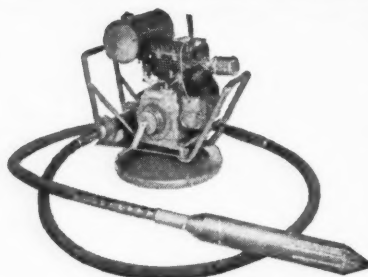
(Continued from page 154)

story house is of the cavity-wall type, catering to the larger family group. It has a total floor area of 1,050 sq. ft.

The Airey house, which the British Government finds particularly suitable for rural districts, is being produced at many centers throughout the country. It embodies frame construction with sheathing of precast vibrated reinforced concrete weather panels, has a pitched or flat roof, is two stories high, with three bedrooms, living room, kitchen and dining recess.

The British Iron and Steel Federation house is based on a grid system so that it can be planned in various ways without altering the main structural shell. The external walls are of ribbed sheet metal, specially treated against corrosion, with a rough "stone" paint finish, and stucco on ribbed galvanized metal. This house, too, has three bedrooms, living room, kitchen and dining recess.

The Orlit house is rather more spacious, though of the same two-  
(Continued on page 158)



Concrete

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Gasoline Engine or  
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OTHER PRODUCTS  
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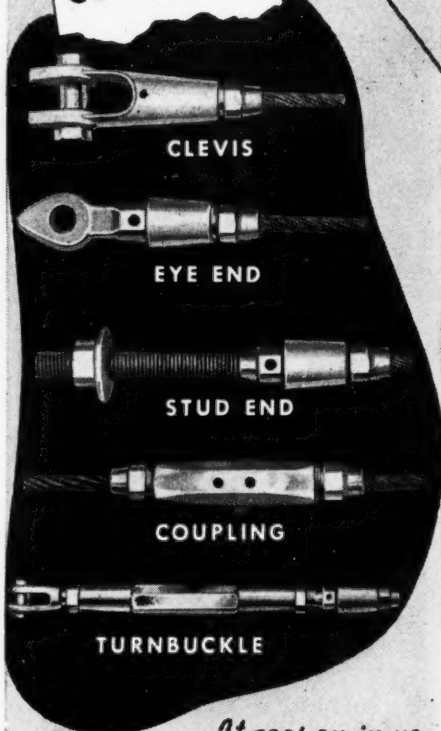
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Mr. Mangum's work includes concrete construction as well as grading, and his experience with Ford Truck equipment is typical of that of hundreds of construction and engi-

neering firms, large and small. All through the industry, it's common knowledge, proved over the years, that Ford Trucks stand up splendidly in the toughest off-the-road service.

There's a new 1946 Ford of two-ton rating, with two-speed axle and 8.25-20 dual rear tires. That's profits to heavy hauling operators. And there are more than thirty important engineering advancements in the 1946 Ford Trucks, designed to make them still more economical, more reliable, more enduring! Check with your Ford Dealer for early delivery!

# ***FORD TRUCKS***

**MORE FORD TRUCKS IN USE TODAY THAN ANY OTHER MAKE**



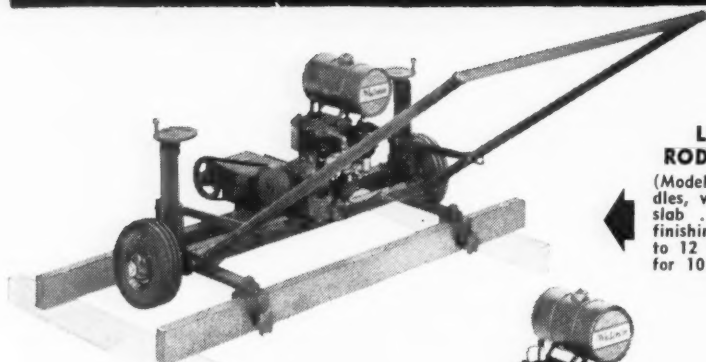
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Ford Truck rear axles—world-famous for load-lugging—provide generous reserve capacity • Light duty chassis have sturdy  $\frac{3}{4}$ -floating axles with triple-roller-bearing, straddle-mounted pinion; full-floating axles in all other chassis • 2-speed axle and vacuum power braking for 2-ton rating • Improved 4-speed transmission at extra cost in light duty chassis, standard in all others.



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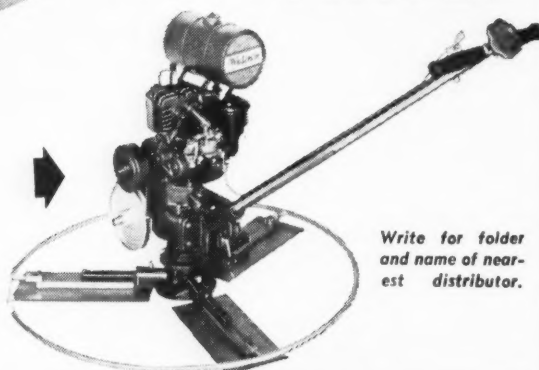


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(Model "RS") screeds, puddles, vibrates and levels the slab . . . prepares it for finishing. For slab widths 3 to 12 ft. Also in Model 44 for 10 to 20 ft. widths.



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The Swivel-type Adjustable Hitch allows the traction wheels of the Spreader to be on the ground at all times regardless of what position the truck or spreader is in. Easily coupled and uncoupled.

Disengaging lever for coupling and uncoupling is extended to the outside of the spreader, eliminating danger for the operator.

Sold and distributed by leading Construction Machinery Dealers throughout the United States and foreign countries.

(Continued from page 156)

story, three-bedroom variety. Its frame is made from precast concrete units, and cavity walls provide thermal insulation.

### Labor-Saving Devices

These are a few examples of the sort of post-war home the British are getting. They have more labor-saving devices than many of their tenants have ever known before, and most of them conform to the average housewife's requirements. She prefers a house to an apartment, likes two stories better than one, and is not really happy without a bit of garden.

Much remains to be done, and it will be some time before housing ceases to be a problem. But a good start has been made, and the drive will increase as labor and materials become available. Meanwhile, critics would do well to remember that no houses were built in Britain between September 1939 and the summer of 1945; that of the 1939 total of 13,000,000 houses, one-third were destroyed by enemy action, 250,000 were seriously damaged, and 4,000,000 slightly damaged.

## Engineer Specifications

(Continued from page 97)

mi. haul, although the capacity of the truck-mixers was 2½ yd., because 2½ yd. filled a little more than 3 ft.

It can be said that these things are ridiculous and exceptional, but there are hundreds of similar cases which develop arguments, coming mostly from an attempt to write into specifications the methods to be used in doing the work. In the matter of simple forms, why should a contractor be told how to build his forms and what material and sizes of lumber he should use? This is his prerogative and, if he gives the result he is paid to give, it is his business how he does it. When specifications detail the methods to be used, they become a text book on construction, and the job engineer and inspector are called upon to show the contractor how to carry out the specified methods. Thus the

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7 feet and Columns up  
to 10 feet. Cut with hand  
saw to lengths on the job.

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engineer and inspector become teachers to the inexperienced contractor, and this possibility develops ill-informed competition for the reliable, skilled, experienced firm.

When methods are specified, the real contractor is robbed of his initiative and ingenuity in doing the job, and the public loses the chance of getting the most for its money. Those writing specifications seldom have the knowledge and the experience of the reliable successful firms which do such work every day, and the specification writers are not in a position to prescribe the best methods for every job.

Present day specifications all along the line are making work cost the public more than it should. It is time that contractors refuse to be a party to this extra, unnecessary cost. Up until now, contractors have taken these encroachments on their work lying down. It is high time they resisted them.

## PILE CASTING

(Continued from page 88)

through all six sheaves; thus the load on each pair of sheaves is equalized.

Each pile is fitted with three equally-spaced lifting points. The spiral casing part of a heavy 2-in. Richmond screw anchor, held by a screw bolt, is cast into the top face of the pile at each point during concrete pouring. When the pile is to be lifted, an eyebolt lag screw is screwed into the incased shell.

E. C. Cunningham is superintendent of the pile casting yard for Tidewater Construction Corp., Norfolk, contractor for the pier job.

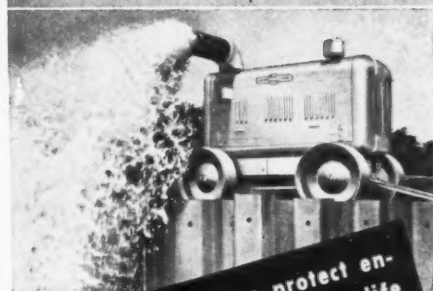
## Pipe Piles

(Continued from page 99)

piles had been jetted, they were burned off 6 1/2 ft. above ground, and were banded to the pole by galvanized straps near the ground line and by a steel collar welded to the piles near their top. Ground water rose in the pipe to within 4 ft. of

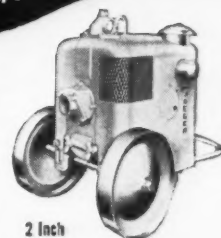
(Continued on page 160)

## JAEGER BUILDS BETTER PUMPS INSIDE and OUT



Modern enclosures protect engine efficiency...add longer life

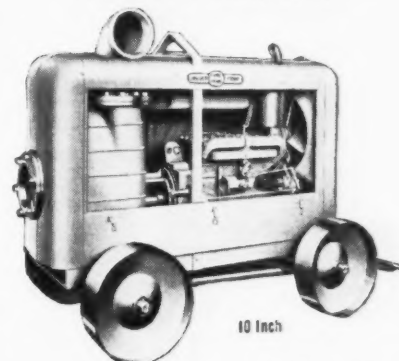
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2 Inch

all "Sure Prime" pumps are better engineered, conservatively rated, powered with high grade engines and enclosed in modern housings that keep those engines dry, clean, quick-starting and smooth running for extra thousands of hours of low cost service.

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10 Inch

Instant opening side panels admit to all operating controls. Enclosures are also designed to lift off or swing open for complete access when desired. One of many exclusive Jaeger advantages.



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**E. D. ETNYRE & CO., Oregon, Illinois**

(Continued from page 159)

the surface, and filling concrete was tremied into the piles through a 4-in. pipe equipped with a flapper foot valve. The weight of the six filled piles is 6½ tons. A coating of coal tar paint was applied to that portion of the piles above the water line and two X-braces and a stiffener cross were added to the pole structure further to strengthen it.

The reinforcing operation was completed in less than a month by Bureau of Reclamation forces from the Colorado-Big Thompson project under the supervision of G. A. Shafer.

## Railroad Track Work

(Continued from page 80)

revolving derrick was equipped with a 35-ft. boom, a two-drum, 30-hp. gasoline hoisting engine, and a cable-swinging attachment. All rail was raised from the car and placed on each side of the track ready for laying on the ties. All spikes, rail anchors, angle bars, and all accessories were distributed by hand from a work train. This operation required 10 men and a foreman, the revolving derrick, a work train and operating crews furnished by the railroad company. Step-by-step procedure of the work is shown in the photographs.

**Rail Relaying**—The rail relaying operation followed the material distribution and normally used 55 to 60 men with one general foreman and three assistant foremen. As much as 4,000 track-ft. was completely relayed in one day, averaging 1¾ mi. for a 5-day week. All swinging ties were tamped directly behind relaying operations. The relaying was always 4 to 5 mi. ahead of the reconditioning work.

**Ballast Removal**—Track skeletonizing and ballast removing followed the rail relaying on some sections and was completed with two different kinds of machines especially designed and constructed for this work. On fills and open track the auger type cribbing machine was used where ample clearances permitted its use. In station grounds, road crossings, underpasses, and other work where clearances were

(Continued on page 162)



## America's Most Complete Line of Material Handling Buckets

*All purpose -*

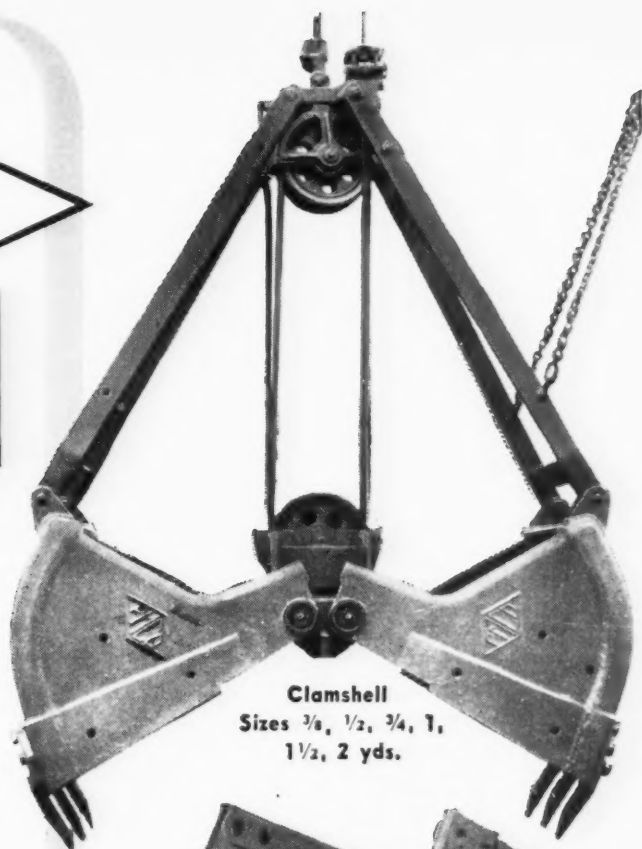
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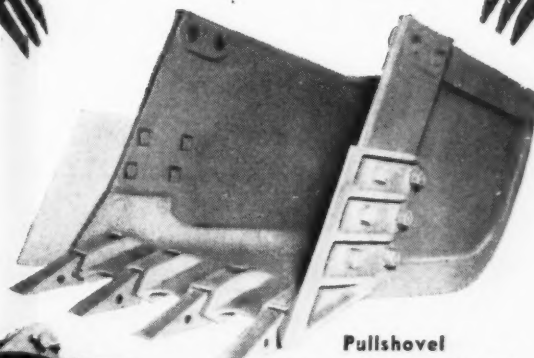
On the 1/2 yd. and 3/4 yd. Shovel, Pullshovel, and Dragline Buckets, all teeth are interchangeable — a great advantage to operators.

### *Experience Counts*

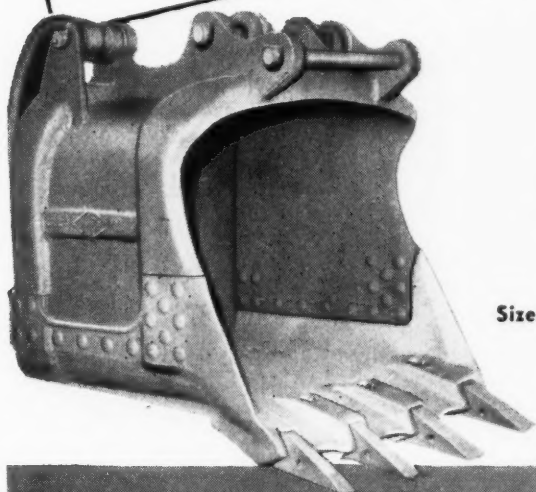
See your shovel man or equipment dealer about PMCO Buckets and Dippers.



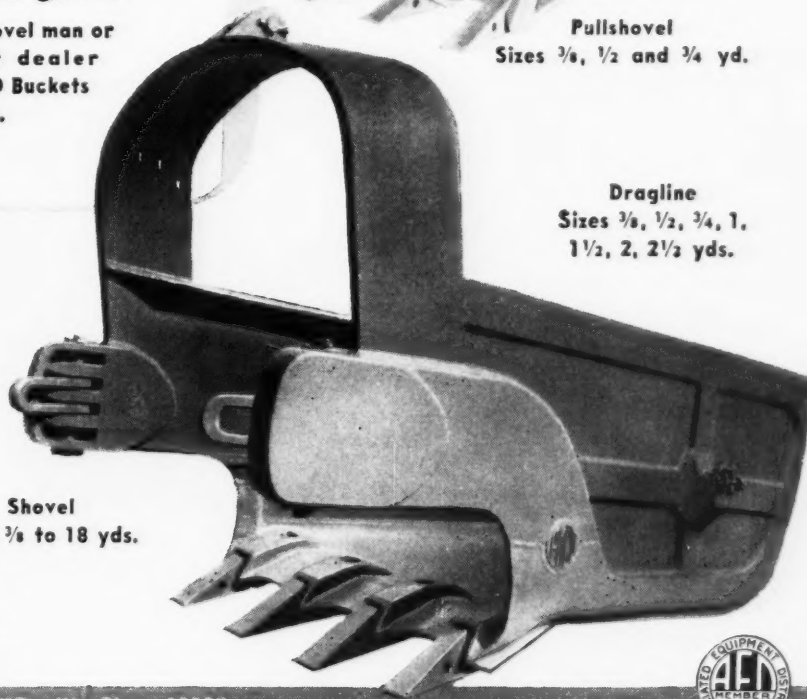
**Clamshell**  
Sizes 3/8, 1/2, 3/4, 1,  
1 1/2, 2 yds.



**Pullshovel**  
Sizes 3/8, 1/2 and 3/4 yd.



**Shovel**  
Sizes 3/8 to 18 yds.



**Dragline**  
Sizes 3/8, 1/2, 3/4, 1,  
1 1/2, 2, 2 1/2 yds.

"Quality Since 1880"

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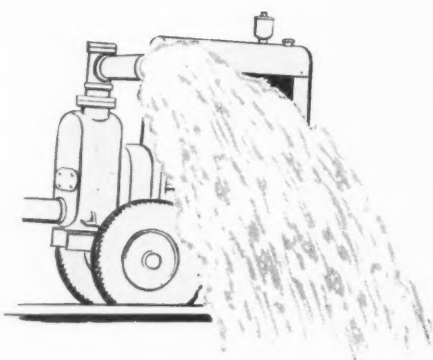
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Many pumps are bought on size. But unless the pump has an AGC rating plate, the size does not assure the capacity.

Why guess? Choose the pump with the AGC rating plate and be sure!

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### The OWEN BUCKET CO.

6020 Breakwater Avenue, Cleveland, Ohio

Branches: New York Philadelphia Chicago Berkeley, Cal.



(Continued from page 160)

limited, the wheel type cribbing machine was used. Both machines were used to clean out the old cemented limestone and slag ballast between the ties so that new ballast could be added.

**Tie Replacement**—The retimbering and tie replacement operation followed the relaying and is one of the few operations that had to be done by hand labor. Several machines, such as a tie puller and tie spacer, were constructed and extensive experiments were made with these machines on replacing ties, but it was determined by a number of time studies that hand labor was the most effective and cheaper method of replacing ties, particularly when the track was stripped and jacks could be used to relieve the pressure on the old tie. From 40 to 50 men were used in the tie-replacing and tie-spacing gangs, averaging more than 500 ties per day, and spacing and surfacing an average of 1,000 ft. of track daily.

Tie replacements on this track were so heavy, averaging approximately 12 ties per rail, that a special machine was designed and constructed to nip and spike the ties by compressed air tools. In the retimbering operation, the old ties were removed and the new ties placed in the track, the tie plates were placed on the ties, and the spikes were set by hand. Every fourth tie was gaged by hand and followed by the pneumatic tie nipper operated by 4 men to spike up solid all ties not gaged by hand. This spiking machine was started around 2 p.m. and completely spiked up 1,000 ft. of track by 5 p.m.

**New Ballasting**—After the track had been retimbered and all old ties were spaced and lined, and the ballast stripped, new granite ballast was unloaded in sufficient quantities to permit a 4-in. raise of the track. This is another operation that was done by hand, especially the jacking of the track, since in order to get a true grade on the track a number of jacks were required. This track was then pulled to within 2 in. of the final grade set by the railroad company engineers. In this surfacing gang, 3 four-unit Jackson electric tampers were used and an average of 22 men with one foreman and an assistant foreman.

After traffic had used the track for about one week the final pull or surface was made, requiring about 2 in. in order to raise the

(Continued on page 164)

**Rely On  
ROGERS**

18' x 40'  
PORTABLE DUAL CRUSHING & SCREENING QUARRY PLANT  
OWNED AND OPERATED BY  
THE HIGHWAY COMMISSION—STATE OF WEST VIRGINIA



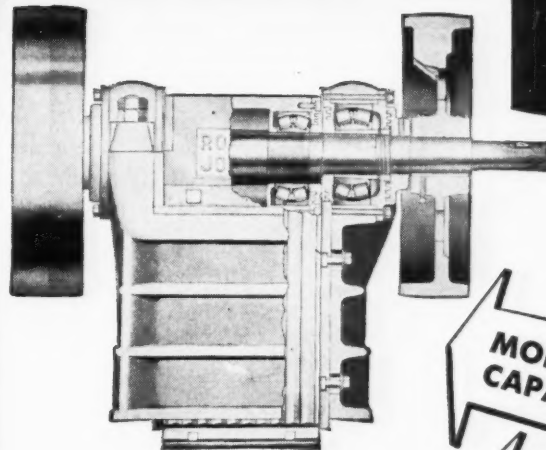
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The Rogers Dual Crushing and Screening Quarry Plant is another example of rock processing machinery that has made the name Rogers synonymous with lower operating and maintenance cost in crushing, sizing, conveying and storing... all over the world.

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Despite greater capacity, there has never been a shaft or bearing failure reported in a Rogers Jaw Crusher because Rogers' thorough construction includes oversize shaft and anti-friction bearings. Available in 16 sizes—write for complete descriptive bulletin.

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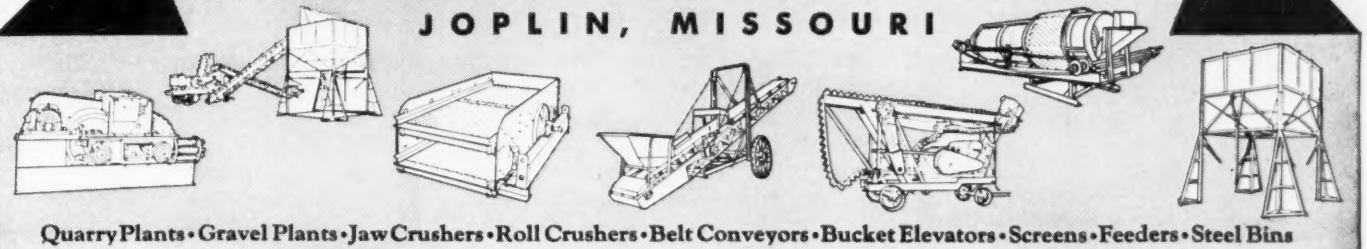
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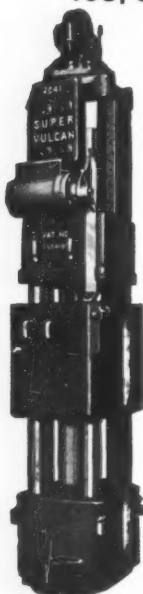




## YOU CAN'T PARALYZE A PILE WITH ONE PUNCH!

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### SUPER-VULCAN OPEN TYPE DIFFERENTIAL-ACTING PILE HAMMERS 18C, 30C, 50C and 80C



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Any type of pile succumbs to Super-Vulcan, the rugged, positive-action hammer that delivers twice the blows per minute and drives 'em down on schedule and with profit-making economy.

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**VULCAN IRON WORKS**  
Since 1852  
331 North Bell Avenue

Chicago 12



—Illinois

(Continued from page 162)

track to the final grades. This work was also accomplished by hand labor on the jacks and Jackson electric tampers tamping the ballast under the ties. This gang normally used 20 to 23 men and completed from 1,400 to 2,000 ft. daily.

**Dressing Out**—Since this work was done on a double-track section, all traffic was detoured during the day over the southbound main line and a dead track was available from 8:30 a.m. until 5:30 p.m. Directly behind the final surfacing gang sufficient ballast was unloaded and spread for dressing out purposes. This work was done with an especially designed and constructed self-propelled machine provided with a V-shape plow in front of the machine and wings on the side for dressing the slope. This machine is operated by 3 men and first plows the ballast from the center of the track and places it on the shoulder where the dressing wings complete the job. These dressing wings are similar and operate in principle as a drag float. Two pockets are provided and the bottoms of the wings are constructed so as to complete the slopes to the true cross-section of the railroad company. Two trips were necessary to plow the ballast out and then approximately three trips were necessary to dress, regulate, and distribute the ballast uniformly on the slope. The machine with the operator and 6 shovel men working behind has completed as much as 2,500 ft. of track in 6 hr.

Normally about 200 track laborers were on the contractor's payroll, but because of absenteeism only about 150 track laborers were available every day.

All operations were planned and coordinated so that about 5 mi. of work was under construction from the beginning of the timbering gang to the final completion. It is believed that this track is now in such condition that no maintenance will be required for at least 5 yr. other than bolt tightening and surfacing of a few soft spots.

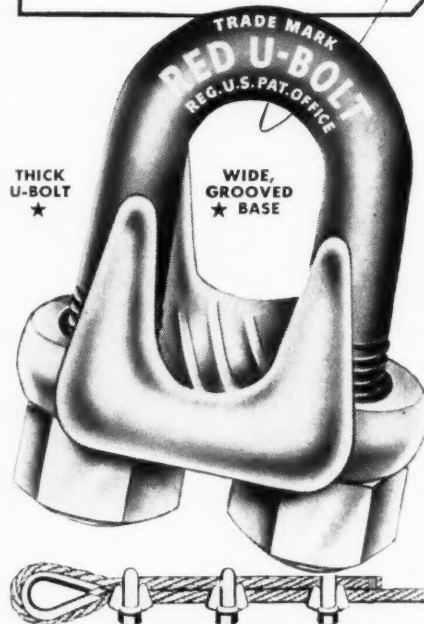
#### Personnel

All contracts were negotiated by L. S. Jeffords, chief engineer, Atlantic Coast Line Railroad Co., who personally visited the work periodically and gave it close supervision. The work on the southern division was in charge of W. J. Turner, engineer, maintenance of

(Continued on page 166)

## The CROSBY CLIP has a SOLID GRIP!

Base fits lay of wire rope — holds firmer and without flattening strands. Available in sizes from  $\frac{1}{8}$ " to 4". Sold everywhere. Manufactured by American Hoist & Derrick Co., St. Paul 1, Minnesota.



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## **...“Marlow Mud Hog”**

The jobs that bog down men and other types of machines are the jobs that a “Mud Hog” takes in stride. Messy, sluggish pumping . . . moving mud, sand, grit, sludge, gumbo, liquids that are almost solids or are filled with trash. These brutes of diaphragm pumps have the stam-

ina to stay and stay . . . on the grueling type of work that would defeat any other pump but a “Champ.”

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● The Moto-Paver does the complete mixing and paving job, and travels from one job to another under its own power. Paving speed is from 4 to 50 feet per minute—road speed up to 18 miles per hour. Mixing capacity 100 to 120 tons per hour. Handles any mixed-in place bituminous material—to any road width, thickness and crown condition. Bulletin MP-46 gives specifications and complete information.

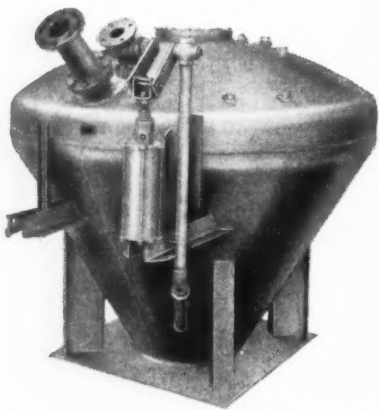
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**MANUFACTURING  
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(Continued from page 164)

way. C. E. Vick, roadmaster, was in charge of all field engineering and supervision. Chief inspector for the railroad company was W. J. Aldridge. Royce Kershaw & Co., of Montgomery, Ala., had the contract from Back Swamp to Savannah, approximately 50 mi., with O. Smith as general superintendent. The C. G. Kershaw Contracting Co. had the contract from Jacksonville to Folkston, under the supervision of R. A. Sey, vice-president. Knox Kershaw acted as project engineer on both projects.

## **Water Mains Cleaned and Lined**

(Continued from page 83)

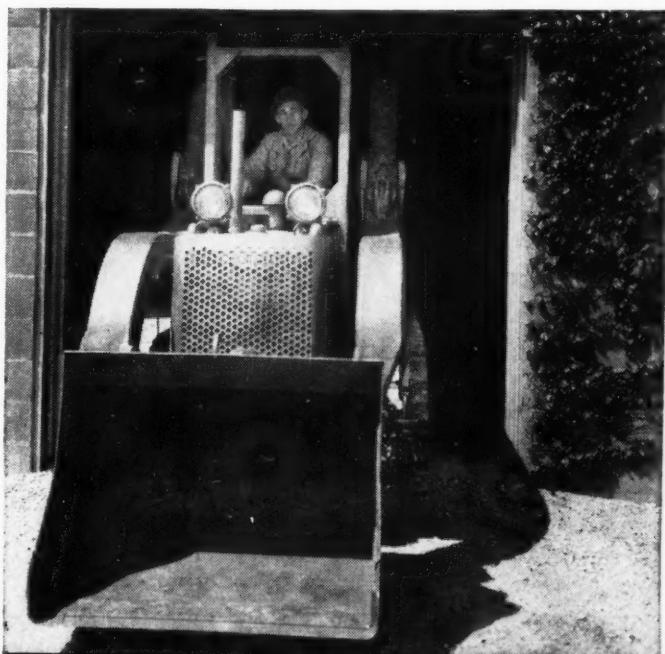
coating is applied to the cleaned pipe by an electrically-operated lining machine designed to travel through the main. Developed by the Centrine Corp., New York, the machine also trowels the lining to a smooth finish. A 1:1 mortar having about a 2-in. slump, and with all sand passing a No. 16 screen, is mixed in a 1/3-yd. electrically powered mixer on a covered trailer-and-truck combination above ground. Sand and cement are stored in the trailer, where the mixer is located, and power for the mixer and lining machine is supplied by a generator mounted on the truck. Mortar is chuted through a manhole or access plate to 4-wheel 2½-cu. ft. buggies in the pipe. Large flanges in the sides of the buggy tops serve as tracks to permit empty cars, returning to the mixer, to pass over those carrying mortar to the liner. Mortar is ladled by pail from the buggies to a 3½-cu. ft. hopper on the front end of the lining machine where it is forced back by screw conveyor to a rotating placing head. Serrated radial fins on the rapidly-rotating head fling a fine spray of mortar against the pipe walls. To the rear of the mortar-distribution head are four paddles, in sets of two, that trowel the lining. The paddle sets are mounted on contra-rotating concentric shafts, and the trowels, on pivoted arms, are held against the lining surface by centrifugal

(Continued on page 168)



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Look for the **ARMSTRONG BROS.**  
BETTER PIPE TOOLS



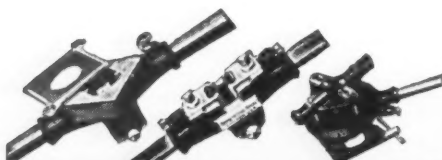
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(Continued from page 166)

force regulated by counterweights and spring action. The lining machine is propelled by electric drive to the rear wheels, and speed of travel governs the lining thickness. A speed of about 3 ft. per min. places a 3/8-in. coating. Lining, placed and finished at the rate of 1,000 lin. ft. per day, is self-cured by condensation within the pipe. After being sterilized with a chlorine solution, the reconditioned section is placed in service and another section is cut out for renovation.

Normally, a 7,000-ft. section of pipe is reconditioned in about two weeks. Cleaning takes 3 days, lining 7 days, and the remainder of the time is used for sterilization and testing.

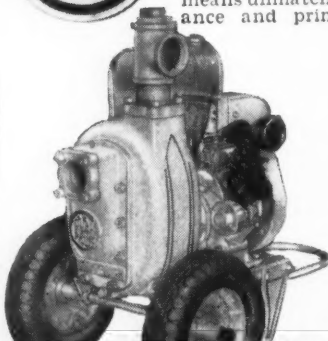
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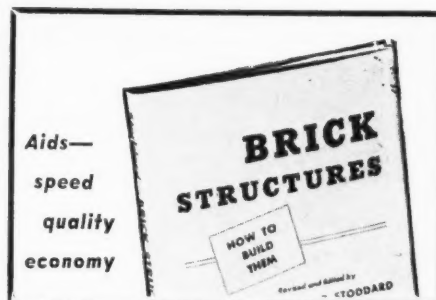


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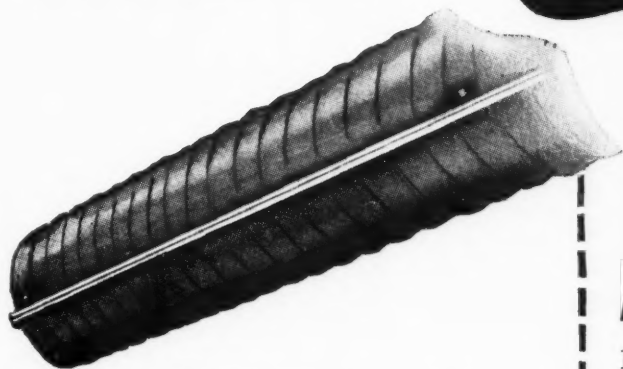
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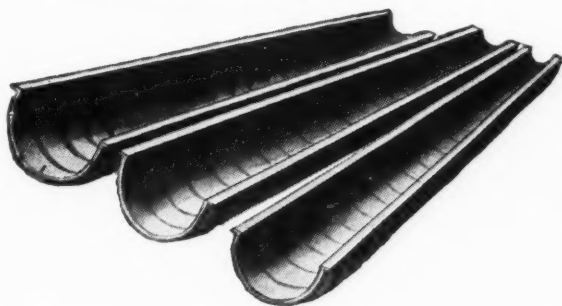
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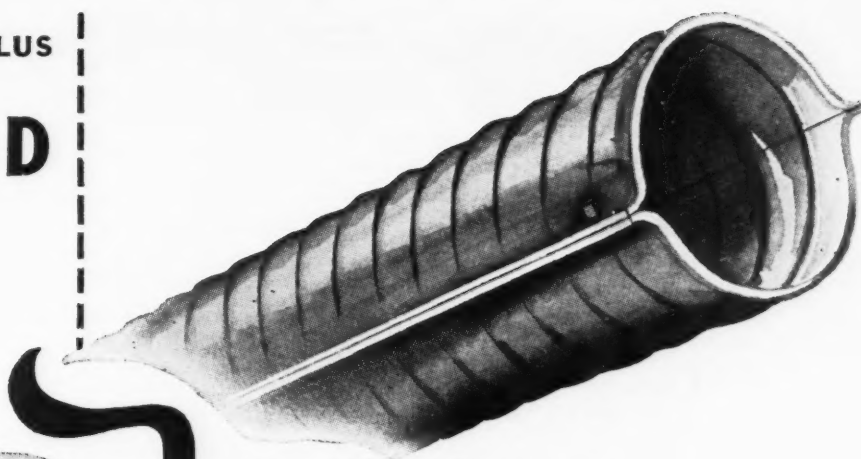


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(Continued on page 172)

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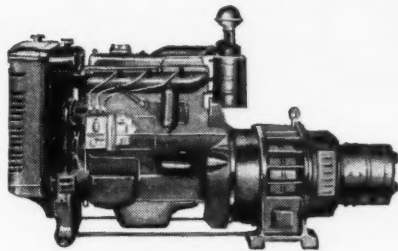
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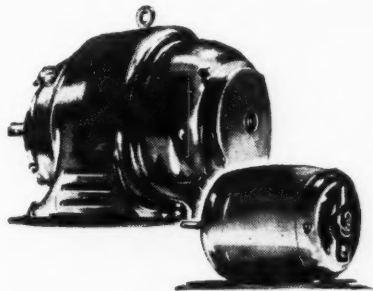
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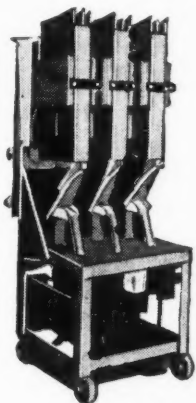
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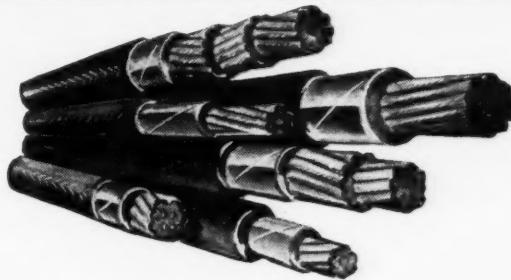
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The offer includes wire and cable, generator sets, transformers, switch gear, wiring devices, sub-station power conversion and protective equipment. Much of it is special but adaptable to a large variety of uses.

It has been *priced to sell* and represents attractive bargains to the alert and resourceful industrialist engaging in speedy reconversion.

(Cut out and send to the nearest WAA office listed below)

War Assets Administration: I am interested in the following checked items:

- |  |   |
|--|---|
| <input type="checkbox"/> WIRE & CABLE            | <input type="checkbox"/> WIRING DEVICES             |
| <input type="checkbox"/> GENERATORS              | <input type="checkbox"/> POWER CONVERSION EQUIPMENT |
| <input type="checkbox"/> SWITCH GEAR             | <input type="checkbox"/> SUB-STATION EQUIPMENT      |
| <input type="checkbox"/> SPECIAL ELECTRIC MOTORS | <input type="checkbox"/> PROTECTIVE EQUIPMENT       |

Name ..... Tel. No. ....

Firm .....

Address .....

City ..... State ..... 319-1

# WAR ASSETS ADMINISTRATION

OFFICES LISTED BELOW ARE TEMPORARILY IN  
RECONSTRUCTION FINANCE CORPORATION AGENCIES

Offices located at: Atlanta • Birmingham • Boston • Charlotte • Chicago • Cleveland • Dallas • Denver  
Detroit • Helena • Houston • Jacksonville • Kansas City, Mo. • Little Rock • Los Angeles • Louisville  
Minneapolis • Nashville • New Orleans • New York • Oklahoma City • Omaha • Philadelphia  
Portland, Ore. • Richmond • St. Louis • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane  
Cincinnati • Fort Worth (Telephone 3-5381)

VETERANS OF WORLD WAR II: To help you purchase surplus property, a veterans' unit has been established in each WAA office.

Additional Searchlight Advertising on page 172



## WHERE TO BUY

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SELF  
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CENTRIFUGALS  
and DIAPHRAGMS



SIZES TO  
8 INCHES

PORTABLE PUMPS  
FOR HEAVY DUTY

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Telephone: Gary 23993



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### Waterproof with Formula No. 640

A clear liquid which penetrates 1" or more into concrete, brick, stucco, etc., seals—holds 1250 lbs. per sq. ft. hydrostatic pressure. Cuts costs: Applies quickly—no mixing—no cleanup—no furring—no membranes. Write for technical data—free sample.

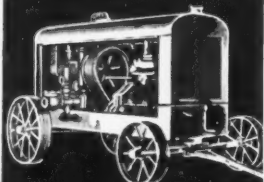
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**C.H.&E.**

CONSTRUCTION  
EQUIPMENT

### Triplex Road Pump

For road paving work a good strong pump is needed to supply water for the paving mixer and other equipment on the job. Capacities from 30 to 150 gals. Write for Bulletin



C. H. & E. Manufacturing Co.  
Milwaukee, Wis.

## SEARCHLIGHT SECTION

(Additional Searchlight Advertising on page 171)

### HEAVY CONSTRUCTION EQUIPMENT

4—4 yard Koehring Concentric Tilting type heavy duty Electric-driven MIXERS.  
4 & 5 ton Goodman battery LOCOMOTIVES 36" gauge.  
3 & 5 yard 36" gauge DUMP CARS.  
1—200 ton Noble BATCH PLANT.  
1—350 ton AGGREGATE PLANT.  
200'—500' 24" BELT CONVEYORS complete with Motors.  
7'x23'x7/8" thick Manganese TROMMEL SCREEN.  
48'x22' PAN FEEDER.  
125' STACKER FRAME.  
1—1 1/4 yard Bucyrus GA-2 Combination SHOVEL & CRANE.  
and many other items of heavy construction equipment.

Subject to prior sale.

**SUNDFELT EQUIPMENT CO.**

3422 First Ave. S., Seattle 4, Wash.

Main 1474

6-pcs. 118' ea. 7/8" 6x37 improved plow steel cable.  
14—25 3/4" steel sheaves; 7/8" rope.  
9-10 groove steel drums; 1/2" rope.  
Several hundred sheaves and castings.  
Steel pinions and gears.

Utility Elevator Service, Inc.

34 Jumel Place, New York City 32, N. Y.

### FOR RENT

One portable Madsen asphalt paving plant with 3000# pug mixer and 6'x28' drier and power.

One Standard portable asphalt paving plant with 3000# pug mixer and 6'x24' drier and power.

Two Jaeger laying machines.

One Model 65 Diamond crusher.

One late model heavy duty Barber-Greene traveling plant.

**G. W. HAGGART & CO.**

FARGO

NORTH DAKOTA

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### BUSINESS OPPORTUNITY

WIRE TEMPLATES: for pipe installation made speedily and accurately at minimum of time and expense by using my invention Pat. 2205811. Will gladly demonstrate. BO 163, Construction Methods, 330 W. 42nd St., New York 18, N. Y.

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Manufacturers' Agent, graduate Mechanical Engineer with technical experience desires additional products and processes for highly successful Sales Agency.

Has been operating own sales office, well established in Philadelphia for 15 years, continuing 20 year association with one company, contacting Architects, Engineers and Contractors.

**RA-162, Construction Methods**  
330 W. 42nd St., New York 18, N. Y.

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**AVELING-BARFORD, LTD.**  
GRANTHAM ENGLAND

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# ACCO-LOC SAFETY SPLICE

***No Distortion of Rope Structure***

***Always 100% Efficient***

Note from this unretouched photograph how the six strands of the dead end have been pushed down and locked into place—and how the six strands of the pull or load rope have not been distorted in any way. Such lack of rope distortion would be impossible with the old, obsolete hand-tuck splicing.

When you cut the ACCO-LOC Safety Splice with an abrasive cut-off machine you see, by cross-section, why this new and revolutionary method for making wire rope endings is so efficient. Not the slightest distortion of rope structure; maintains equalized stresses in all strands; no off-center pull on the load rope.

More than being 100% efficient, the ACCO-LOC Safety Splice is safe. No seizing wires to loosen; no wire ends to barb. Extremely flexible and easy to handle. Send today for fully detailed literature.

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Get that rock  
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with **TIMKEN ROCK BITS**  
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The more rock you drill, the more you will appreciate the advantages of the Timken Rock Bit.

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